Date: 15 February 2000

To: Bechtel Hanford Inc. (technical representative)

From: TechLaw, Inc.

Project: 200 Area Source Characterization - 200-CW-1 Operable Unit Subject: PCBs - Data Package No. H0590-RLN (SDG No. H0590)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0590-RLN prepared by Recra LabNet (RLN). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B0WMD1	10/21/99	Soil	С	PCBs by EPA 8082
BOWMD2	10/21/99	Soil	С	PCBs by EPA 8082
BOWMD3	10/21/99	Soil	С	PCBs by EPA 8082
BOWMD4	10/21/99	Soil	С	PCBs by EPA 8082
BOWMD5	10/21/99	Soil	С	PCBs by EPA 8082
BOWMD6	10/21/99	Soil	С	PCBs by EPA 8082
BOWMD7	10/21/99	Soil	С	PCBs by EPA 8082
BOWMD8	10/21/99	Soil	С	PCBs by EPA 8082

Data validation was conducted in accordance with the BHI validation statement of work and the 200-CW-1 Operable Unit RI/FS Work Plan and 216-B-3 RCRA TSD Unit Sampling Plan, DOE/RL-99-07, Draft B. Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

MEGES VEST EDMC Appendix 4. Laboratory Narrative and Chain-of-Custody Documents

Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all nondetects are rejected and flagged "UR".

All holding times were met.

Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than CRQL. If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than CRQL, the result is qualified as undetected and elevated to the CRQL.

All method blank target compound results were acceptable.

Accuracy

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike analyses are performed in duplicate and must be within control limits of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Nondetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to the matrix spike/matrix spike duplicate being diluted out of the samples, all PCB results were qualified as estimates and flagged "J".

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Nondetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Nondetected compounds with surrogate recoveries above the upper control limit require no qualification.

Due to the surrogate being diluted out of the sample, all undetected PCB results in samples BOWMD1, BOWMD2, BOWMD3, BOWMD4 and BOWMD5 were rejected and flagged "R" and all detected results were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. The RPD for solid samples is ≤30% for soils. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the matrix spike/matrix spike duplicate being diluted out of the samples, all PCB results were qualified as estimates and flagged "J".

Field Duplicate Samples

One pair of field duplicate samples (samples BOWMD1/BOWMD2) were submitted to RLN for analysis. The duplicate sample results were compared

using the validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the CRDL to ensure that laboratory detection levels meet the required criteria. The reported detection levels exceeded the CRDL for all analytes (except aroclor-1260) in samples BOWMD1, BOWMD2, BOWMD3, BOWMD4 and BOWMD5. Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels were above the analyte specific CRDL.

Completeness

Data Package No. H0590-RLN (SDG No. H0590) was submitted for validation and verified for completeness. The completion percentage was 46%.

MAJOR DEFICIENCIES

Due to the surrogate being diluted out of the samples, all undetected PCB results in samples BOWMD1, BOWMD2, BOWMD3, BOWMD4 and BOWMD5 were rejected and flagged "R". Rejected data is unusable and should not be reported.

MINOR DEFICIENCIES

Due to the surrogate being diluted out of the samples, all detected PCB results in samples BOWMD1, BOWMD2, BOWMD3, BOWMD4 and BOWMD5 were qualified as estimates and flagged "J". Due to the matrix spike/matrix spike duplicate being diluted out of the samples, all PCB results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

The reported detection levels exceeded the CRDL for all analytes (except aroclor-1260) in samples BOWMD1, BOWMD2, BOWMD3, BOWMD4 and BOWMD5. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-99-07, Draft B, 200-CW-1 Operable Unit RI/FS Work Plan and 216-B-3 RCRA TSD Unit Sampling Plan.

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision-making purposes.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value.
 The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0590	REVIEWER: TLI	DATE: 2/15/00	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242 Aroclor-1248, Aroclor-1254	R	BOWMD1, BOWMD2, BOWMD3, BOWMD4, BOWMD5	Surrogate diluted out
Aroclor-1260	J	BOWMD1, BOWMD2, BOWMD3, BOWMD4, BOWMD5	Surrogate diluted out
All	J	All	MS/MSD diluted out

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFO	RD			·													
Laboratory: Recra LabNet																	
Case	SDG: H	0590															
Sample Number	-	BOWMD1		BOWMD2		BOWMD3		BOWMD4		BOWMD5		BOWMD6		BOWMD7		BOWMD8	
Location		B Pond		B Pond		B Pond		B Pond		B Pond		B Pond		B Pond		B Pond	
Remarks				Duplicate													
Sample Date		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99	
PCB	CRDL	Result	Q	Result	ď			Result	Q		d		Q	Result	a	Result	Q
Arocler-1016	100	3600	UR	3600	UR	720		7400		700	UR	36	บม	34	IJ	35	W
Aroclor-1221	100	7200	UR	7200	UR	1400	_	15000	UR	1400		72	υJ	68	υJ	69	υJ
Aroclor-1232	100	3600	UR	3600	UR	720		7400	_	700	UR	36	IJ	34	IJ	35	UJ
Aroclor-1242	100	3600	-	3600	$\overline{}$	720		7400	_	700		36	UJ	34	กา		UJ
Aroclor-1248	100	3600	_	3600		720	_	7400	-	700			IJ	34	W	35	IJ
Aroclor-1254	100	3600	_	3600	_	720	UR	7400		700		36	เกา	34	UJ	35	ហ
Aroclor-1260	100	9100	J	7700	J	1300	J	33000	J	2100	J	36	υJ	34	w	35	บม
														<u> </u>			Ш
					_				oxdot								Ш
									\vdash				<u> </u>		_		1
			_														Н
<u></u>			_										_		<u> </u>		-
			_					<u> </u>					_	<u> </u>	_		Ш
			<u> </u>				_	ļ							_		Ш
			L					ļ	_						_		Ш
			_						_		_						ш
											_		_				Н
																	Н
					-												\vdash
										- 1							Н
					_				-		_						⊢⊢
			\vdash		_				-				_				Н
									-		_		_		_		Н
·											_				_		Н
						_			\dashv								\vdash
																	\mathbf{H}
							_									 	Н
									-							 	\vdash
			H	-												 	₩
			_										-		_		┼┤
			H						\vdash		_		-	ļ			
			H						\vdash				\vdash				
		<u> </u>	_										_				\vdash
							•								-		 -
			.							<u> </u>	_		—		_		\vdash
		<u></u>			\Box				لـــا			l					ш

Recra LabNet - Lionville Laboratory

Client: TNU-HANFORD B99-078

RFW Batch Number: 9910L501

PCBs by GC

Report Date: 11/24/99 15:26

Work Order: 10985001001 Page: 1

BOWMD4 Cust ID: BOWMD1 BOWMD1 BOWMD1 BOWMD2 BOWND3 Sample 001 004 RFW#: 001 MS 002 003 001 MSD Information SOIL SOIL Matrix: SOIL SOIL SOIL SOIL 100 200 D.F.: 100 20.0 100 100 Units: UG/KG UG/KG UG/KG UG/KG UG/KG UG/KG Surrogate: Tetrachloro-m-xylene D ł D ł D ł D Ł D ¥ D ¥ Decachlorobiphenvl D D D ¥ D D D uQ υQ U R Aroclor-1016 7400 π 3600 3600 U 3600 U 3600 720 Aroclor-1221 7200 U 15000 7200 U 7100 U 7200 U 1400 U U Aroclor-1232 7400 3600 U 3600 U 3600 U 3600 720 U U IJ Aroclor-1242 3600 U 720 U 7400 U 3600 U 3600 U 3600 U U Aroclor-1248 3600 U 3600 U 3600 U 3600 U 720 υ 7400 u W $\mathbf{u}\mathbf{\Psi}$ 720 7400 Aroclor-1254 3600 $\mathbf{u}\mathbf{v}$ 3600 UV D ł D 33000 Aroclor-1260 7700 1300 9100 9000 8600

	Cust ID:	BOWND 5		BOWMD		BOWMD?	,	BOMMD	8	PBLKYH		PBLKYH BS	
Sample	RFW#:	005		006	;	007	,	008	3	99LE1303-1	Œ1	99LB1303-M	4B1
Information	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
Š	D.F.:	20.	0	1.0	10	1.0	00	1.0	00	1.0	00	1.0)O
5	Units:	UG/K	G	UG/F	(G	UG/I	KG	UG/i	KG	UG/I	CG	UG/K	(G
Surrogate:	Tetrachloro-m-xylene	D	*	92	- -	92		102	- <u>'</u>	92	*	95	*
_	Decachlorobiphenyl	D	*	97	¥	98	¥	101	ŧ	101	*	100	¥
********			=fl===	z=====	=f1==:		=fl==	******	==fl		≖fl	==========	==fl
Aroclor-1016	<u> </u>	700	υR	36	Γ σ	34	U J	35	υ	J 33	U	33	U
Aroclor-1221		1400	ט	72	UI	68	υĭ	69	U	67	U	67	U
Arocior-1232		700	ប	36	ט \	34	ט /	35	U	33	U	33	U
Aroclor-1242		700	ט	36	ן ט	34	ן ט	35	Ū	33	U	33	U
Aroclor-1248		700	ט	36	ן ט	34	ט	35	Ü	33	U	33	U
Aroclor-1254		700	υΨ	36	ט [34	U .	35	U	, 33	U	82	ક્ષ
Aroclor-1260		2100	1	36	υV	34	U V	35	Ū	Y 33	Ū	33	U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Laboratory Narrative and Chain-of-Custody Documentation

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia Analytical Report

Client: TNU-HANFORD B99-078

W.O.#: 10985-001-001-9999-00

RFW#: 9910L501

Date Received: 10-23-99

SDG/SAF#: H0590/B99-078

PCB

The set of samples consisted of eight (8) soil samples collected on 10-21-99.

The samples and their associated QC samples were extracted on 10-26-99 and analyzed according to Recra OPs based on SW846, 3rd Edition procedures on 11-18,19,20,22-99. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. The cooler temperature has been recorded on the chain-of-custody.
- 2. All required holding times for extraction and analysis have been met.
- The samples and their associated QC samples received a sulfuric acid and sulfur cleanup. 3.
- 4. The method blank was below the reporting limits for all target compounds.
- 5. All obtainable surrogate recoveries were within acceptance criteria.
- 6. The blank spike recovery was within acceptance criteria.
- 7. All matrix spike recoveries were within acceptance criteria.
- 8. Most samples required instrument dilutions due to high concentrations of target analytes. Reporting limits have been adjusted to reflect the necessary dilutions.
- 9. All initial calibrations associated with this data set were within acceptance criteria.

10. All continuing calibration standards analyzed prior to sample extracts were within

acceptance criteria.

J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

Welke

pef\r:\group\data\pest\10L501.pcb

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

Bechtel Hanford	Inc.		СНА	IN OF CUST	rody/s	AMPLI	EANAL	YSIS	REQUES	r	B99	9-078-144	Page]	of 1
Collector Bowers/Trice		- 0	Company Chris Co		Telephone No. Project Coor 372-9574 TRENT, SJ						Price Code	8N	Data Tu	rasrouad
Project Designation 200 Area Source characteriza	tion - 200-CW-1 OU		ampling 200 B	Location pond					SAF No. B99-078				45	Days
lee Chest No. 672 C 99 01			ield Logi EL-151	book No.	 				Method of Ship FED EX	ment				
Shipped To DAA/RECRAD (3) 10-1			Offsite Pro	operty No					Bill of Lading/	Air Bill N	o.			
									COA BZ	20C	W16	710	-	
POSSIBLE SAMPLE HAZA	RDS/REMARKS			Preservation	None	· Coal 4C	None	Cool 4	C Cool 4C	Cool 4C	None			
		•	T	Type of Container	∌G	aG	∌G	∎G	aG .	≱G	∌G			
			N	o. of Container(s)	1	l	'	T		ı				
Special Handling and/or Stor	age		1	Volume	60ml	250mL	250ml.	500m	L 500mL	1000mE	. 1000mL			
	SAMPLE ANA	ALYSIS			Inotopie Uranium	VOA - 8260A (TCL); VOA - 8260A (Add- On) {1- Propesol, Ethanol)	pH (Soil) - 9045	See item (Special Instruction	8270A (TCL);	See item (2) Special Instruction	Special			
Sample No.	Matrix •	Sample D	Patc	Sample Time								Star and	in July	
BOWMD)	Soil	10-21	- 29	1012	٠	Х	Х	Х	Х	χ		Bowy		
BOW MD2	Soyl	10-01	99	1017		y	У	Х	Х	Υ		Bowy	9	
BOWMD3	501)	10-01	17	1047		y	Ž	y	Х	,		Bowgu	10	
BOWMD4	5-1)	10-01-	99	1107		, K	X	.	Х	, X		Bongy		ال ا
Bownos	501	10-91-	19_	1118	RF	X	X	. 😾	X	\		Bowy	9 K	SAPYIL
CHAIN OF POSSESSION		Sign/	/Print Na	imet [0.22.49	SPEC See cl	AL INSTRI		(S 5 Oct SAF 1899-078.				Matrix Soil	• •
elinquished By	21-19/1400 Date/Time	Received By	3c_1	10-11-99)		Seleni Vanad (2) N	um, Silver); IC ìum, Zinc}; M D2/NO3 - 353.	P Metals ercury - 74 I; IC Anic	ntrace) {Arsenic, B - 6010A (Supertrac 171 - (CV); Chromons - 300.0 {Chlori tonia - 350.3; Total	e Add-On) ium Hex - 7 de, Fluoride	{Beryllium, Cop 196 :, Nitrate, Nitrite	per, Nickel,	Water Vapor Other Solid Other Liquid	r
Ref 3C-10-2 Ilinquished By Relation See Land	Date/Time / 3	30 Received By	2 5	الاهر - الا	for 2-7	(3) G Europi Total	umma Spectros um-155); Gam	copy (Ces	sium-137, Coba)(-6 - Add-on (Americi topic Plutonium; Is	0, Europiun um-241); S	n-152, Europium trontium-89,90 -	- Total Sr;		
ABORATORY Received By SECTION	19 1000	Viel 1	Ver	7 16:23-79	1000 Tid							Da	te/Time	
INAL SAMPLE Disposal Med DISPOSITION	hod						Dispos	ed By				Dav	te/Time	

ï

Bechtel Hanford	Inc.		CHAIN OF CUS	TODY/SA	MPLI	EANAL	YSIS	REQUEST	r	В99	9-078-145	Lage I	ot T
Collector Bowers/Trice			npany Contact Bris Cearlock	Telephone 372-957				Project Coordi TRENT, SJ	nator	Price Code	8N		rnaround
Project Designation 200 Area Source characteriza	ntion - 200-CW-1		pling Location 00 B pond		_			SAF No. B99-078				45	Days
ERC 96	<u>. ১৯হ</u>		d Logbook No. L-1511					Method of Ship FED EX	ment				
Shipped To TMA/RECRA	01.29	Offs	ite Property Na. A ØØ O &	op E	<u> </u>			Bill of Lading/	air Bill No 35	195	3 _l	8961	0
	·· ···········			·					064		710	- 	<u></u>
Possible sample Haza	RDS/REMARK	.	Preservation	None	None	None	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None
			Type of Container	∎G	aG	яG	a.G	aG	≱G	aG	≱G	aG	≱G
Special Handling and/or Stor	Tage	•	No. of Container(s) Volume	60mL	1 60mL	60mL	 120ml	. 250mL	l 250mL	500mL	500mL	1000mL	1 1000mL
920000	SAMPLE A	NALYSIS	· · · · · · · · · · · · · · · · · · ·	Isotopic Vraniam	Nickel-63	Techantium-99	Trickum -	H3 VOA - 1260A (TCL); VOA - 8260A (Add- On) [1- Propanol, Edismol]	pH (Soil) - 9945	See item (1) in Special Instructions.	Semi-VOA - 8270A (FCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	Sex item (2) in Special Instructions.	See item (3) in Special Instructions.
Sample No.	Matrix •	Sample Date	Sample Time	Paris III	- (1)					NEE		THE STATE OF	
How MD6	Soil	10-21-	99 1130			· 		$ X_{-}$	X	 	<u> X</u>	X	
Bomm D7	5-1)	10-11,						 X	X_	 	X_	X	
Bo mm D8	5-,1	10-91-	97 1/1					 	Ϋ́X	X	<u> </u>	×	
					<u>-</u>			-[[
CHAIN OF POSSESSION			int Names		See ch	-	com ments	on SAF B99-078.				Matrix Soil Water	•
elinquisted By Ref 3C 10 2a.		Received By	C 10-21-99/	過度 .94/ DXD	Selenii Vanad (2) NO Sulfate	ım, Silver); IC ium, Zinc); Me 02/NO3 - 353.1 }; Sulfides - 90	P Metals - reury - 74 I; IC Anion)30; Ammi	trace) {Assenic, Ba 6010A (Supertrac 71 - (CV); Chromins - 300.0 {Chlorid onis - 350.3; Total ium-137, Cobalt-60	e Add-On) (um Hex - 71 le, Fluoride, Cyanide - 9	(Beryllium, Cop 196 Nitrate, Nitrite, 010	per, Nickel, , Phosphate,	Vapor Other Solid Other Liquid	
clinquished By KIKKIThon Thomas and a second state of the second	Palganga 1430 Date/Time	Received By Received By	2K	te/Time	Europi Total l	um-155); Gam	ma Spec -	Add-on (Americia opic Plutonium; Isc	um-241); St	- 00,59 rontium	- Total Sr;		
LABORATORY Received By	23.99 100	o Ville	1033.99	1000 Title	45	, Bow	861		t - 54	501	D	ate/Time	
SECTION TINAL SAMPLE Dispusal Me	hod					Dispose	d By		<u> </u>	<u>ال) ل</u>	Ď	ate/Time	

Bechtel Hanford I	nc.		CHAIN OF CUS	rody/s	AMPL)	E ANAL	YSIS I	REQUES	r	B99	9-078-144	Page 1	of I
Collector Bowers/Trice			pany Contact rris Cearlock	· Telephor				Project Coordi TRENT, SJ	instor	Price Code	8N	Data Tu	rnaround C
Project Designation 200 Area Source characterization	on - 200-CW-1 OU	Sam	pling Location					SAF No. B99-078				45	Days 3
Ice Chest No. EPC 96.	025		Logbook No.	•	77.			Method of Ship FED EX	pment	···			-
Shipped To TMA/REPRA \$ 18 6/1		Offsi	1e Property No.	BD	5			Bill of Lading/	AIFBINN 35	795	3	Ø9	166
								COA B	300	اتس	671	(2)	
Possible sample hazari	DS/REMARKS		Preservation	None	Cool 4C	None	Cool 40		Cool 4C				
			Type of Container	s G	.sG	aG	≱G	aG	∌G	aG			
Special Handling and/or Storag	e		No. of Container(s) Volume	i 60mL	1 250mL	I 250mL	500mL	. 500mL	1000ml	. IQQQmL		-	
000017	SAMPLE ANAL	.YSIS	A DIBME	Isotopic Uranium	VOA - \$260A (TCL); VOA - \$260A (Add- On) {1- Propenol, Ethenol}	pH (Soil) - 9045	See item (1) Special Instruction	8270A (TCL);	See item (2) Special Instruction	Special			
Sample No.	Matrix *	Sample Date	Sample Time						20195		東東京		
Bounni	alsoil .	10.21-1	18 1917	X						_ X_	Boy	'9T9	8.10 × 10
	5011	1000	9 1017	X						X	Boy	Sauce 2	<u> </u>
BOWMD3 DE	-601	10-01-1	9 1047	<i>N</i>				_	, 57	626.90		qwo	
Bount 4	5011	10-21.2	1 1)09	_ <u>X</u> _					BY.		 	quo	
Bownon	301	10-91.7	7 	للإسا	SPEC	IAL INSTRU	CTIONS			_X	Boul	Matrix	•
teliganisted By	Date Time 49 0800	Received By P	3C 10-21-17 1KK1 Thoren Date 10-22-10-20-20-20-10-20-20-20-10-20-20-20-20-20-20-20-20-20-20-20-20-20	eTime/ 79/08/ eTime	See ed (1) K Seleni Vanac (2) N Sulfat (3) G Europ Total Ameri	nain of custody CP Metals - 601: ium, Silver}; IC lium, Zine}; Me O2/NO3 - 353. e}; Sulfides - 96 amma Spectross ium-155}; Gam	comments OA (Superts P Metals - ercury - 74 1; IC Anior 030; Ammo copy (Cesi una Spec -	on SAF B99-078, race) {Arsenic, B: 6010A (Supertrac 71 - (CV); Chromi is - 300.0 (Chlori mia - 350.3; Total um-137, Cobalt-6 Add-on (Americi pic Plutonium; Is	e Add-On) ium Hex - 7 de, Fluoride l Cyanide - ' 0, Europiun um-241); S	(Beryllium, Cop 196 5, Nitrate, Nitrite, 9010 n-152, Europium trontium-89,90 –	per, Nickel, Phosphate, 154, Total Sr; 12};	Soil Weter Vepor Other Solid Other Liquid	
SECTION						Dispose	ad By				Dal	le/Time	
FINAL SAMPLE Disposal Method DISPOSITION	J			· ·			, 						

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	. A	В	(c)	D	Е
PROJECT: 2	رهن درس -ا		DATA PACKAGE		
VALIDATOR:	TU	LAB: Rock	4	DATE: 1/3	1/00
CASE:		<u> </u>	SDG: Ho	5.90	
		ANALYSES	PERFORMED		
□ CLP3/90	□ SW-846 8080	☐ SW-846 8081	Ø 8085	0	0
SAMPLES/MATE	RIX Bowy	101 BOWN	102 Boune	D3 BOWM	04
	Bow	MOS BOWN	104 BOWM	07 130 WM	Dg
		- ·		·	
		· · · · · · · · · · · · · · · · · · ·			
			<u> </u>		Soil
Is a case nar Comments:	rrative presen	it?			es No N/A
2. HOLDING	TIMES				
	olding times a	cceptable?		(Yes No N/A
•		•			
3. INSTRUME 3.1 INSTRUME Are DDT reter	NT PERFORMANCE ENT PERFORMANCE ntion times action standard in	E AND CALIBRA CE (METHOD 80 cceptable .	TIONS 80 AND 8081)		Yes No /N/A

000019

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are DBC retention times acceptable? Yes	No	N/A
Is the GC/MS tuning/performance check acceptable? Yes	No	$\left(N/P\right) $
Comments:		$\overline{}$
• .		
		
1		
3.2 CALIBRATIONS (METHOD 8080 AND 8081)		
Are EVAL standard calibration factors and %RSD values acceptable? Yes	No	N/A
Are quantitation column calibration factor %RSD values acceptable? Yes	No	N/A
Were the analytical sequence requirements met? Yes	No	N/A
Are continuing calibration %D values acceptable? Yes	No	W/A
Comments:		
3.3 INSTRUMENT PERFORMANCE AND INITIAL CALIBRATION (3/90 SOW)		
Was the initial calibration sequence performed? Yes	No	/ N/A
Was the resolution acceptable in the resolution check mix? Yes	No	N/A
Is resolution acceptable in the PEM, INDA and INDB? Yes	No	N/A
Are DDT and Endrin breakdowns acceptable? Yes	No	N/A
Are retention times in PEMs and calibration mixes acceptable? . Yes	No	N/A
Are RPD values in the PEMs acceptable? Yes	No	N/A
Are %RSD values acceptable? Yes	No	N/A
Comments:		$\frac{\mathcal{O}}{\mathcal{O}}$
3.4 CALIBRATION VERIFICATION (3/90 SOW)		$\overline{}$
Were the analytical sequence requirements met? Yes	No	N/A
Is resolution acceptable in the PEMs? Yes	No	N/A
Are initial calibrations acceptable? Yes	No	1 .
Wie intriet cetinierious accehrantet 162	NO	N/A

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are retention times acceptable in the PEMs. INDA and INDB mixes? Yes	No N/A
Are RPD values in the PEMs acceptable? Yes	No N/A
Are the DDT and endrin breakdowns acceptable? Yes	No N/A
Was GPC cleanup performed? Yes	No N/A
Is the GPC calibration check acceptable? Yes	No N/A
Was Florisil cleanup performed? Yes	No N/A
Is the Florisil performance check acceptable? Yes	No N/A
Comments:	
4. BLANKS	
Were laboratory blanks analyzed? Yes	No N/A
Are laboratory blank results acceptable?	No N/A
Were field/trip blanks analyzed? Yes	No N/A
Are field/trip blank results acceptable? Yes	No NTA
Comments:	
	
5. ACCURACY	
Were surrogates analyzed?	No N/A
Are surrogate recoveries acceptable? Yes	N/A
Were MS/MSD samples analyzed?	No N/A
Are MS/MSD results acceptable? Yes	No N/A
Were LCS samples analyzed? Yes	No ALA
Are LCS results acceptable? Yes	No N/A
Comments: DI-DS surr clil aut - R	
Dil aut MS(MSD - Jull	

PESTICIDE/PCB DATA VALIDATION CHECKLIST

6. PRECISION
Are MS/MSD RPD values acceptable? Yes No N/A
Are laboratory duplicate results acceptable? Yes No, NA
Are field duplicate RPD values acceptable? Yes N/A
Are field split RPD values acceptable? Yes No (N/A)
Are field split RPD values acceptable? Yes No N/A Comments: July - No MS(USO - duly) 70
FD Born 3170 ccd 579, H 5736
7. SYSTEM PERFORMANCE
Is chromatographic performance acceptable? Yes No $/N/A$
Are positive results resolved acceptably? Yes No (N/A
Comments:
· · · · · · · · · · · · · · · · · · ·
8. COMPOUND IDENTIFICATION AND QUANTITATION
Is compound identification acceptable? Yes No (N/A)
Is compound quantitation acceptable? Yes No \N/A
Comments:
<u> </u>
9. REPORTED RESULTS AND QUANTITATION LIMITS
Are results reported for all requested analyses? Yes No N/A
Are all results supported in the raw data? Yes No (N/A)
Do results meet the CRQLs? Yes No N/A
Comments: all one 1-5

Date:

15 February 2000

To:

Bechtel Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project: 200 Area Source Characterization - 200-CW-1 Operable Unit Subject: Semivolatiles - Data Package No. H0590-RLN (SDG No. H0590)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0590-RLN prepared by Recra LabNet (RLN). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
BOWMD1	10/21/99	Soil	С	See note 1
BOWMD2	10/21/99	Soil	С	See note 1
BOWMD3	10/21/99	Soil	С	See note 1
BOWMD4	10/21/99	Soil	С	See note 1
BOWMD5	10/21/99	Soil	С	See note 1
B0WMD6	10/21/99	Soil	С	See note 1
BOWMD7	10/21/99	Soil	С	See note 1
BOWMD8	10/21/99	Soil	С	See note 1

^{1 -} Semivolatiles by EPA 8270B

Data validation was conducted in accordance with the BHI validation statement of work and the 200-CW-1 Operable Unit RI/FS Work Plan and 216-B-3 RCRA TSD Unit Sampling Plan, DOE/RL-99-07, Draft B. Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

• Blanks

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected, "U".

All method blank results were acceptable.

Accuracy

Matrix Spike/Matrix Spike Duplicate Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 70% to 130%. If spike recoveries are

outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to a matrix spike recovery of 56% and matrix spike duplicate recovery of 61%, all phenol, 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, dimethylphthalate, di-n-butylphthalate, butylbenzylphthalate, bis(2-ethylhexyl)phthalate, di-n-octylphthalate, and isophorone were qualified as estimates and flagged "J".

Due to a matrix spike recovery of 66%, all pentachlorphenol, 2,4,6-trichlorophenol and 2,4,5-trichlorophenol results were qualified as estimates and flagged "J".

Due to a matrix spike recovery of 63% and a matrix spike duplicate recovery of 67%, all 1,3,-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, hexachloroethane, hexachlorobutadiene and hexaclorocyclopentadiene results were qualified as estimates and flagged "J".

Due to a matrix spike recovery of 64% and a matrix spike duplicate recovery of 69%, all 2-chlorophenol, 2,4-dichlorophenol, 4-chloro-3-methylphenol, bis(2-chloroethyl)ether, bis(2-chloroethoxy)methane, 4-chorophenyl phenyl ether, and 4-bromophenyl phenyl ether results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the CRQL are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All sample surrogate recovery results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results for solid samples must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All MS/MSD RPD results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples BOWMD1/BOWMD2) were submitted to RLN for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the CRDL to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels were above the analyte specific PQL. Under the BHI statement of work, no qualification is required.

Completeness

Data package No. H0590 was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to a matrix spike recovery of 56% and a matrix spike duplicate recovery of 61%, all phenol, 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, dimethylphthalate, di-n-butylphthalate, butylbenzylphthalate, bis(2ethylhexyl)phthalate, di-n-octylphthalate, and isophorone were qualified as estimates and flagged "J". Due to a matrix spike recovery of 66%, all pentachlorphenol, 2,4,6-trichlorophenol and 2,4,5-trichlorophenol results were qualified as estimates and flagged "J". Due to a matrix spike recovery of 63% and a matrix spike duplicate recovery of 67%, all 1,3,-dichlorobenzene, 1,4dichlorobenzene, 1,2-dichlorobenzene, hexachloroethane, hexachlorobutadiene and hexaclorocyclopentadiene results were qualified as estimates and flagged "J". Due to a matrix spike recovery of 64% and a matrix spike duplicate recovery of 69%, all 2-chlorophenol, 2,4-dichlorophenol, 4-chloro-3-methylphenol, bis(2chloroethyl)ether, bis(2-chloroethoxy)methane, 4-chorophenyl phenyl ether, and 4bromophenyl phenyl ether results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All reported laboratory detection levels were above the analyte specific PQL. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, Validation Statement of Work, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-99-07, Draft B, 200-CW-1 Operable Unit RI/FS Work Plan and 216-B-3 RCRA TSD Unit Sampling Plan.

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. The
 associated concentration is an estimate, but the data are usable for
 decision-making purposes.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value.
 The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0590	REVIEWER: TLI	DATE: 2/15/00	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
phenol, 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, dimethylphthalate, di-n-butylphthalate, butylbenzylphthalate, bis(2-ethylhexyl)phthalate, di-n-octylphthalate, isophorone, pentachlorphenol, 2,4,6-trichlorophenol 2,4,5-trichlorophenol 1,3,-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, hexachlorobtadiene hexaclorocyclopentadiene 2-chlorophenol, 2,4-dichlorophenol, 4-chloro-3-methylphenol, bis(2-chloroethyl)ether, bis(2-chloroethoxy)methane, 4-chorophenyl phenyl ether, 4-bromophenyl phenyl ether	J	All	MS/MSD percent recovery

Qualified Data Summary and Annotated Laboratory Reports

نب
-
-

Project: BECHTEL-HANFORD				7													
Laboratory: RECRA LabNet				1													
Case:	SDG: H	0590		1													
Sample Number		BOWMD1		BOWMD2		BOWMD	BOWMD3		BOWMD4		BOWMD5			BOWMD7		воммря	
ocation B Pond			B Pond		B Pond		B Pond		B Pond		B Pond		B Pond		B Pond		
Remarks				Duplicate	Duplicate							<u> </u>					
Sample Date		10/21/99		10/21/99	10/21/99		10/21/99		10/21/99			10/21/99		10/21/99		10/21/99	
Extraction Date		10/28/99		10/28/99		10/28/99		10/28/99		10/28/99		10/28/99		10/28/99		10/28/99	
Analysis Date	11/5/99			11/5/99		11/3/99		11/5/99		11/3/99		11/4/99		11/4/99		11/4/99	
Semivolatile (8270B)	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	330	360	IJ	360	UJ	360	UJ	1900	υJ	350	UJ	360	UJ	350	UJ	350	วไบม
bis(2-Chloroethyl)ether	330	360	UJ	360	UJ	360	UJ	1900	UJ	350	IJ	360	ÜJ	350			วไปป
2-Chlorophenol	330	360	UJ	360	UJ	360	UJ	1900	UJ	350	IJ	360	UJ	350	υJ	350	נטונ
1,3-Dichlorobenzene	330	360		360	UJ	360	UJ	1900	UJ	350	UJ	360	บม	350			บบ
1,4-Dichlorobenzene	330	360	UJ	360	ÚJ	360		1900	UJ	350	UJ	360		350		<u> </u>	JUJ
1,2-Dichlorobenzene	330	360	IJ	360	UJ	360	IJ	1900	UJ	350	UJ	360	UJ	350	IJ	350	าไปป
2-Methylphenol	330	360		360	5	360	υJ	1900		350	UJ	360	UJ	350	ŪJ	350	UJ
2,2'-oxybis(1-Chloropropane)	330	360	U	360	ט	360	U	1900	U	350	U	360	U	350	U	350	U
4-Methylphenol	330	360	UJ	360		360	UJ	1900	UJ	350	ŪĴ	360	IJ	350	UJ	350)UJ
N-Nitroso-di-n-propylamine	330	360	U	360	U	360	دا	1900	U	350	U	360	٦	350	U	350	U
Hexachloroethane	330	360		360		360	3	1900	3	350	ÜĴ	360	IJ	350	IJ	350	UJ
Nitrobenzene	330	360		360	U	360	U	1900	S	350	U	360	U	350	U	350	U
Isophorone	330	360		360		360		1900	IJ	350	IJ	360	IJ	350	IJ	350	UJ
2-Nitrophenol	330	360	U	360	U	360	U	1900	C	350	U	360	U	350	U	350	Ū
2,4-Dimethylphenol	330	360		360		360		1900	IJ	350	UJ	360	UJ	350	ŪĴ	350	UJ
bis(2-Chioroethoxy)methane	330	360	UJ	360	UJ	360	S	1900	IJ	350	UJ	360	IJ	350	υJ	350	UJ
2,4-Dichlorophenol	330	360		360	IJ	360	IJ	1900	IJ	350	IJ	360	IJ	350	UJ	350	UJ
1,2,4-Trichlorobenzene	330	360	U	360	C	360	C	1900	C	350	U	360	U	350	U	350	U
Naphthalene	330	360		360		360	U	1900	U	350	U	360	Ü	350	U	350	U
4-Chloroaniline	330	360	U	360	Ü	360	IJ	1900	U	350	U	360	U	350	U	350	U
Hexachlorobutadiene	330	360		360		360		1900	IJ	350	IJ	360	IJ	350	ÜĴ	350	UJ
4-Chloro-3-methylphenol	330	360	UJ	360	ÜJ	360	IJ	1900	IJ	350	IJ	360	IJ	350	UJ	350	UJ
2-Methylnaphthalene	330	360	C	360	Ü	360	U	1900	Ü	350	Ü	360	U	350	U	350	U
Hexachlorocyclopentadiene	330	360	UJ	360	UĴ	360	UJ	1900	UJ	350	UJ	360	UJ	350	ŪJ	350	UJ
2,4,6-Trichlorophenol	330	360	- +	360	UJ	360	UJ	1900	IJ	350	S	360	UJ	350	ÜJ	350	UJ
2,4,5-Trichlorophenol	800	900	υJ	900	UJ	900	UJ	4600	IJ	880	IJ	900	UJ	860	UJ	870	W
2-Chloronaphthalene	330	360		360	U	360	U	1900	U	350	U	360	U	350	U	350	U
2-Nitroaniline	800	920		900	υ	900		4600	U	880	Ú	900	U	860	u	870	U
Dimethylphthalate	330	360	υJ	360	UJ	360	UJ	1900	UJ	350	υJ	360	UJ	350	UJ	350	UJ
Acenaphthylene	330	360	U	360	<u>u</u>	360	Ü	1900	U	350	Ú	360	U	350		350	
2,6-Dinitrotoluene	330	360	υT	360	Ū	360	U I	1900	U	350	U	360	u l	350		350	

Project: BECHTEL-HANFORD												•					
Laboratory: RECRA LabNet	_			1													
Case:	SDG: H	0590]													
Sample Number		BOWMD1	30WMD1		B0WMD2		BOWMD3		BOWMD4		BOWMD5		1	BOWMD7		BOWMD	8
Location		B Pond		B Pond	B Pond		B Pond		B Pond			B Pond		B Pond		B Pond	_
Remarks				Duplicate													
Sample Date	Sample Date 10/21/99			10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/9	9
Extraction Date 10/28/99			10/28/99		10/28/99		10/28/99		10/28/99		10/28/99		10/28/99		10/28/99		
Analysis Date		11/5/99		11/5/99		11/3/99		11/5/99		11/3/99		11/4/99		11/4/99		11/4/9	9
Semivolatile (8270B)	CRQL	Result	a	Result	Q	Result	Q	Result	Q	Result	Q_	Result	a		Q	Result	Q
3-Nitroaniline	800	920	U	900	Ú	900	U	4600	U	880	U	900	u	860	U	87	οU
Acenaphthene	330	360	J	360	U	360	U	1900	U	350	U	360	U	350	U	35	0 U
2,4-Dinitrophenol	800	920	ט	900	J	900	U	4600	U	880	U	900	U	860	U	87	οU
4-Nitrophenol	800	920	J	900	J	900	Ü	4600	U	880	Ū	900	u	860	U	87	οJu
Dibenzofuran	330	_ 360	Ū	360	U	360	U	1900	U	350	Ű	360	U	350	Ü	35	οU
2,4-Dinitrotoluene	330	360	U	360	U	360	U	1900	U	350	Ū_	360	U	350	U	35	οU
Diethylphthalate	330	360	U	360	υ	360	U	1900	U	350	Ū.	360	U	350	U	35	o U
4-Chlorophenyl-phenyl ether	330	360	υJ	360	บ่า	360	IJ	1900	IJ	350	บบ	360	UJ	350	UJ		olnn
Fluorene	330	360	٦	360	٥	360		4600	U	880	Ū_	360	U	350	Ų	35	οU
4-Nitroaniline	800	900	U	900	U	900	ح	4600	J	880	<u> </u>	900	U	860	Ü	87	olu
4,6-Dinitro-2-methylphenol	800	920	Ū	900	دا	900	د	4600	C	880	<u>u</u>	900	U	860		87	0 U
N-Nitrosodiphenylamine	330	360	U	360	υ	360	J	1900	J	350	Ū_	360	U	350	U		ō Ū
4-Bromophenyl-phenyl ether	330	360	UJ	360	IJ	360	IJ	1900	บป	350	ŪJ	360	บบ	350	UJ	35	o UJ
Hexachlorobenzene	330	360	U	360	٦	360	ح	1900	J	350	Ū	360	U	350	Ū		οU
Pentachlorophenol	800	900	3	900	5	900	3	4600	_	880	UJ_	900		860	_		o ni
Phenanthrene	330	92		81		360	U	1900	U	33		360	U	350			οU
Anthracene	330	360	U	360		360	_	1900	U	350		360		350			이미
Carbazole	330	360	U	360		360	U	1900	U	350		360		350			o u
Di-n-butylphthalate	330	68	J	55	J	360	_	1900		350	υĴ	360		350			olnn
Fluoranthene	330	190		180		360		1900	U	89		360		350			이
Pyrene	330	190		180		360		1900		92		360	—	350			o u
Butylbenzylphthalate	330	360	IJ	360		360		1900	_	350	_	360		350			olnn
3,3'-Dichlorobenzidine	330	360	U	360	U	360		1900		350	<u>u_</u>	360		350			o u
Benzo(a)anthracene	330	64		63		360	_	1900		44		360		350			0 U
Chrysene	330	120		120		360		1900		62		360		350			ο(υ
bis(2-Ethylhexyl)phthalate	330	71	_	53		72		2000		110		360		350			olnn
Di-n-octylphthalate	330	360	UJ	360	UJ	360		1900		350	UJ	360		350	_		olu
Benzo(b)fluoranthene	330	110		74		360		1900		37		360		350			olu
Benzo(k)fluoranthene	330	120		82		360		1900		51		360		350			o u
Benzo(a)рутеле	330	91		80		360	_	1900		56		360	_	350			0 U
Indeno(1,2,3-cd)pyrene	330	61		60		360		1900		34		360		350			olu
Dibenz(a,h)anthracene	330	22		360	U	360	U	1900	U	350	U	360		350			οJU
Benzo(g,h,i)perylene	330	75		61		360	U	1900	U	38		360	U	350	U	35	o u
																	1
	-																

Recra LabNet - Lionville Laboratory

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 9910L501

*= Outside of BPA CLP OC limits.

Client: TNU-HANFORD B99-078 Work Order: 10985001001 Page: la Cust ID: BOWMD1 BOWMD1 BOWMD1 BOWMD2 BOWMD3 BOWMD4 Sample RFW# . 001 001 MS 001 MSD 002 003 004 Information Matrix: SOIL SOIL SOIL SOIL SOIL SOIL D.F.: 1,00 1.00 1.00 1.00 1.00 5.00 Units: UG/KG UG/KG UG/KG UG/KG UG/KG UG/KG Nitrobenzene-d5 ł 66 65 ¥ 72 ł ł 70 ł 58 ş Surrogate 2-Fluorobiphenvl 72 ¥ 71 ¥ 81 ¥ 75 1 78 ¥ 67 Ł Recovery Terphenv1-d14 75 Ł 77 ¥ 88 ¥ 79 ł 78 ž 71 Ł Phenol-d5 55 ¥ 57 ¥ 63 ¥ 57 ¥ 56 ¥ 46 Ł 2-Fluorophenol 59 ٤ 60 Ł 66 æ 61 2 62 Ł 53 68 2,4,6-Tribromophenol 72 ¥ 82 ł 70 Ł 66 48 Ł =====f]=: UJ v T บป Phenol 360 56 ł ŧ 360 360 L σ 61 1900 bis(2-Chloroethyl)ether UT IJ 360 360 360 360 IJ U 360 U 1900 U 2-Chlorophenol_____ UJ 360 64 ł 69 ¥ 360 U 360 u 1900 IJ 1,3-Dichlorobenzene____ $\mathbf{u} \mathbf{\Sigma}$ 360 360 U 360 U 360 U 360 U 1900 U 1.4-Dichlorobenzene____ ロゴ 360 63 ¥ 67 Ł 360 П 360 u 1900 U 1,2-Dichlorobenzene_____ υJ 360 360 IJ 360 () 360 IJ 360 U (I 1900 2-Methylphenol_____ υŢ υV 360 360 U πV 360 II 360 360 UV 1900 2,2'-oxybis(1-Chloropropane) IJ U 360 360 U 360 U 360 360 U 1900 U 4-Methylphenol 360 UT 360 IJ 360 U 360 UJ 360 UI 1900 U T N-Nitroso-di-n-propylamine _____ 360 U 70 ş. IJ IJ 74 ž 360 360 1900 U Hexachloroethane____ 360 UT U.J υT 360 U 360 U 360 360 U.T 1900 ₩ Nitrobenzene_____ 360 U U 360 U 360 U 360 U 360 1900 U Isophorone 360 U.T UJ 360 U 360 U 360 υT 360 1900 UJ 2-Nitrophenol_____ U U 360 360 17 360 360 U 360 1900 D) 2.4-Dimethylphenol_____ UI v J 360 360 U 360 U 360 11.7 UT 1900 360 bis(2-Chloroethoxy)methane____ UT υJ υJ U J 360 360 Ħ 360 Ħ 360 360 1900 2,4-Dichlorophenol_____ v J 360 UJ UJ $\mathbf{u} \mathbf{J}$ 360 U 360 U 360 360 1900 1,2,4-Trichlorobenzene _____ 360 IJ 74 Ł 79 ł 360 Ħ 360 Ħ 1900 11 360 U 360 U 360 U 360 U 360 U 1900 (I Naphthalene 4-Chloroaniline 360 U 360 U 360 U 360 U 360 U 1900 U Hexachlorobutadiene_____ U J 360. U 🎵 υĴ 1900 360 U 360 U 360 UJ 360 $\mathbf{n}\mathbf{J}$ 4-Chloro-3-methylphenol_____ UJ 1900 360 U T 70 ł 75 360 UJ 360 2-Methylnaphthalene_____ 360 U 360 U 360 U 1900 U 360 U 360 U 360 UT 360 U J 360 U.T 1900 บป Hexachlorocyclopentadiene_____ 360 U 360 U v T u T 1900 2,4,6-Trichlorophenol_____ 360 360 U 360 UJ 360 UI 360 IJ 900 11 7 น วิ 2,4,5-Trichlorophenol 900 UJ 900 U 900 UI 900 4600

RFW Batch Number: 9910L501 Cust I	<u>Client:</u> D: BOWMD1		BOWMD1		BOWMD:		Order: 10		BOWMD:		<u>Page: 1b</u> BOWMD		
•							002						
RFW#:	#: 001	001		001 MS		001 MSD			003	\$	004		
2-Chloronaphthalene	360	บ	360	ט	360	ับ	360	บ	360	U	1900		
2-Nitroaniline	900	U	900	บ	900	U	900	U	900	U	4600	Ų	
Dimethylphthalate	360	U	360	U	360	U	360	U	360	U	1900	U	
Acenaphthylene	360	U	360	U	360	U	360	U	360	Ü	1900	U	
2,6-Dinitrotoluene	360	U	360	U	360	U	. 360	U	360	U	1900	U	
3-Nitroaniline	900	ប	900	ប	900	ซ	900	U	900	U	4600	U	
Acenaphthene	360	U	76	*	83	ł	360	Ū	360	Ū	1900	U	
2,4-Dinitrophenol	900	U	90 0	U	90 0	U	900	U	. 900	U	4600	U	
4-Nitrophenol	900	U	71	*	77	*	900	U	900	U	4600	U	
Dibenzofuran	360	U	360	U	360	U	. 360	U	360	U	1900	U	
2,4-Dinitrotoluene	360	U	71	*	79	*	360	บ	360	U	1900	υ	
Diethylphthalate	360	U	360	U	360	U	360	U	360	Ü .	1900	U	
4-Chlorophenyl-phenylether	360	υJ	360	ប	360	ប	360	บร	360	บวั	1900	υ,	
Fluorene		U	360	ប	360	U	360	U	360	U	1900	U	
-Nitroaniline		U	900	U	900	U	900	U	900	U	4600	U	
,6-Dinitro-2-methylphenol	900	U	900	U	900	U	900	U	900	U	4600	U	
N-Nitrosodiphenylamine (1)	360	ָּט	360	U	. 360	U	360	U	360	U	1900	U	
I-Bromophenyl-phenylether		υI	360	ប	360	U	360	υJ	360	UJ	1900	บ	
iexachlorobenzene	360	U _	360	U	360	U	360	U _	360	U	1900	U	
Pentachlorophenol	900	υJ	66	¥	76	*	900	UJ	900	υJ	4600	U.	
Phenanthrene	92	ß	70	8	88	<i>y</i>	81	X	360	U	1900	U	
Anthracene		U	360`	U	360	ΰ	360	U	360	U	1900	U	
Carbazole	360	Ų	360	U	360	U	360	U _	360	U	1900	U	
AnthraceneCarbazole	68	打	5 7	<i>ي</i> تر	56	78	55	ys I	360	v T	1900	υ.	
luoranthene	190	đ	140	y	170	B	180	<i>B</i> .	360	U	1900-	U	
Pyrene	400	đ	80	18	92	*	180	Ø	360	ប	1900	U	
Butylbenzylphthalate	360	υT	360	U	360	υ	360	UJ	360	UJ	1900	ប្	
3,3'-Dichlorobenzidine		U	360	U	360	ប	360	U	360	U	1900	U	
Benzo(a)anthracene		B	44	ð	58	ø	63	ß	360	U	1900	U	
Chrysene		đ		A	110	, <u>z</u>	120	A	360	U_	1900	U	
ois(2-Ethylhexyl)phthalate		SI	97	8	130	8		力工	72	# J	2000		
Di-n-octyl phthalate	360	υJ	360	,	360	ΰ	360	ับ วั	360	UJ	1900	บ 🕽	
Senzo(b) fluoranthene			92		95		74		360		1900		
enzo(k) fluoranthene			82	7 '	100		82		360	U	1900	U	
			100	ď	88	đ		,ā	360	U	1900	U	
enzo(a)pyrenendeno(1,2,3-cd)pyrene	61	8	69	76	59	ت ر	60	<i>y</i>	360	U.	1900	U	
ibenz(a,h)anthracene			28	تر	59 22	A	360	ັບ	360		1900		
Senzo(g,h,i)perylene			83	ß	64	1	61		360		1900		
(1) - Cannot be separated from D		-		<i>'</i>				•	•				

Semivolatiles by GC/MS, HSL List

Report Date: 12/15/99 10:37 Work Order: 10985001001 Page: 2a Client: TNU-HANFORD B99-078 RFW Batch Number: 9910L501

SBLKFK BS BOWMD6 BOWMD7 BOWMD8 SBLKFK BOWMD5 Cust ID: 99LE1313-MB1 99LE1313-MB1 007 008 005 006 Sample RFW#: SOIL SOIL SOIL SOIL SOIL SOIL Matrix: Information 1.00 1.00 1.00 1.00 1.00 1.00 D.F.: UG/KG UG/KG UG/KG UG/KG UG/KG Units: UG/KG ¥ ¥ Ł 76 * ¥ 71 ł 72 Nitrobenzene-d5 68 * 78 왐 74 Ł 82 75 76 ¥ 80 ş ş Surrogate 2-Fluorobiphenyl Ł 77 ¥ 71 ş Ł 86 Terphenyl-d14 75 82 ¥ 83 Recovery 49 ¥ 56 ¥ 61 Ł Phenol-d5 59 Ł 57 ¥ 59 55 ¥ 60 ž 65 ş. 60 Ł 2-Fluorophenol 63 Ł 왐 60 2,4,6-Tribromophenol 51 47 ł 60 ■f1 บ วี ת ט UI 350 330 U 49 ¥ 360 350 350 Phenol 330 U U 350 U 330 U U 350 bis(2-Chloroethyl)ether 350 П 360 56 ¥ 330 U U 350 U 350 U 350 U 360 2-Chlorophenol 330 U 36Ô IJ 350 11 350 U 330 U 350 IJ 1.3-Dichlorobenzene 350 U 330 U 68 Ł 350 IJ 350 Ħ 360 11 1.4-Dichlorobenzene U 350 U 350 U 330 U 330 IJ U 1,2-Dichlorobenzene_____ 350 360 350 υV 330 U 330 U 350 IJ 360 $\pi \star$ 350 UV 2-Methylphenol 350 U 350 Ħ 330 U 330 U u 360 U 2,2'-oxybis(1-Chloropropane)____ 350 UJ UT 350 330 U 330 U U I 350 4-Methylphenol 350 u T 360 61 ¥ U 350 U 330 U N-Nitroso-di-n-propylamine 350 I) 360 IJ 350 U J 330 U Hexachloroethane 350 $\mathbf{u} \, \mathbf{I}$ 360 UI 350 UT 350 330 U IJ 330 U 330 U U 360 U 350 U 350 Nitrobenzene 350 UT 350 υJ 330 U 330 U 360 U T 350 v T 350 Isophorone 360 U 350 U 330 U 330 U 2-Nitrophenol_____ 350 T) IJ 350 UT u T 350 U.S U J 360 350 330 U 330 U 350 2,4-Dimethylphenol บวี บร 330 U U υJ 360 บวั 350 350 330 bis (2-Chloroethoxy) methane 350 $\mathbf{n} \mathbf{J}$ บ 🇸 u J 350 330 U 330 I) 2.4-Dichlorophenol 360 UT 350 U 330 U 81 ŧ 1,2,4-Trichlorobenzene 350 U 360 Ū 350 U IJ IJ 350 n 350 IJ 330 11 330 350 11 360 Naphthalene IJ 330 U 330 U 350 U 360 U 350 11 350 4-Chloroaniline υſ נים 360 UJ 350 330 U 330 U 350. U J Hexachlorobutadiene u I 360 U J บา 350 350 330 U 49 ¥ 350 U T 4-Chloro-3-methylphenol U U 330 U -330 Ħ 2-Methylnaphthalene_____ 350 U 360 U 350 350 350 UJ 350 UT 350 UT 330 U 330 U Hexachlorocyclopentadiene_____ 360 U.T v J 330 350 UJ UI 350 UT 350 330 U U 2,4,6-Trichlorophenol 360 บป 880 UJ 860 υJ 870 840 U 840 U 2.4.5-Trichlorophenol 900 UJ

*= Outside of EPA CLP QC limits.

			6	BOWMD?	₹	BOWMD	•	SBLKFK		SBLKFK BS	,
	_		_		_		_				
00!	5	000	6	007	7	001	}	99LE1313-N	1 B1	99LB1313-	MB:
350	U	360	U	350	U	350	U	330	U	330) [
880	U	900	U	860	U	870	U	840	U	840) (
350	U	360	U	350	U	350	U	330	U	. 330) (
350	U	360	U	350	U	350	U	330	U	330) (
350	ប	360	ប	350	U	350	U	330	U	330) (
880	U	900	U	860	υ	870	U	840	U	840) (
350	U	360	U	350	U	350	U	330	U	71	:
880	U	900	U	860	U	870	U	840	U	840) }
880	U	900	Ü	860	U	870	Ū	840	Ü	50	
350	U	360	U	350	Ū	350	υ	330	U	330	1
350	ប	360	U	350	ט	350	U	330	U	58	
→ 350	υ	360	U	350	U	350	U	330	U	330	1
350	ប	360	U	350	U	350	U·	330	U	330	1
350	ប	360	U	350	Ü	350	U	330	U	330	1
880	U	900	U	860	Ü	870	U	840	U	840	1
880	U	900	U	860	Ü	870	U	840	U	840	ı
3 5 0	U	360	U	350	U	350	U	330	U	330	1
350	Q.	360	U	350	Ū	350	U	330	Ū	330	1
	U	360	U	350	U	350	U	330	U	330	1
880	U	900	U	860	Ũ.	870	U	840	U	60	:
33	\$	360	U	350	U	350	U	330	U	330	
350	ับ	360	U	350	Ü	350	U	330	U	330	ı
350	U	360	U	350	ប	350	U	330	U	330	Į
350	U	360	U	350	U	350	U	330	Ū	330	τ
89	J	. 360	U	350	U	350	Ų	330	U	330	Į
92	_	360	U	350	U	350	U	330	U	71	1
350	์ บ	360	U	350	U	350	U	330	U	330	ı
350	U	360	U		ប	350	U	330	U	330	t
	X				Ü		U		U		C
	8		_		-		-				ī
	•				_		-				ָ ו
350			-		_		_		-		_
										· ·	
	_										
	350 880 350 350 880 350 880 350 350 350 350 350 350 350 350 350 35	350 U 880 U 350 U 350 U 350 U 880 U 880 U 350 U	350 U 360 880 U 900 350 U 360 350 U 360 880 U 900 350 U 360 880 U 900 880 U 900 880 U 900 350 U 360	350 U 360 U 360 U 350 U 360 U 350 U 360 U 360 U 350 U 360 U	350 U 360 U 350 880 U 900 U 860 350 U 360 U 350 350 U 360 U 350 880 U 900 U 860 350 U 360 U 350 880 U 900 U 860 350 U 360 U 350 880 U 900 U 860 350 U 360 U 350 360 U 350 350 U 360 U 350 360 U 350 380 U 900 U 860 880 U 900 U 860 880 U 900 U 860 350 U 360 U 350 350 U 360 U 350	350 U 360 U 350 U 350 U 350 U 350 U 360 U 350 U 360 U 350 U 360 U 350 U 350 U 350 U 360 U 350 U 350 U 350 U 350 U 350 U 350 U 360 U 350 U	350 U 360 U 350 U 350 U 350 350 U 350 350 U 360 U 350	350 U 360 U 350 U 350 U 350 U 350 U 350 U 350 U 360 U 350 U	350 U 360 U 350 U 350 U 350 U 330 880 U 900 U 860 U 870 U 840 350 U 360 U 350 U 350 U 350 U 330 350 U 360 U 350 U 350 U 350 U 330 880 U 900 U 860 U 870 U 840 350 U 360 U 350 U 350 U 350 U 330 880 U 900 U 860 U 870 U 840 880 U 900 U 860 U 870 U 840 350 U 360 U 350 U 350 U 350 U 330 360 U 360 U 350 U 350 U 350 U 330 360 U 360 U 350 U 350 U 350 U 330 350 U 360 U 350 U 350 U 330 350 U 360 U 350 U 350 U 330	350 U 360 U 350 U 350 U 330 U 350 U 330 U 350 U 360 U 350 U 350 U 330 U 350 U 350 U 330 U 350 U 350 U 350 U 330 U 350	350 U 360 U 350 U 350 U 350 U 330 U 330 330 U 330 350 U 360 U 350 U 350 U 350 U 330 U 330 U 330 U 330 U 350 U 350 U 350 U 350 U 330 U 330 U 330 U 350

Laboratory Narrative and Chain-of-Custody Documentation



Chemical and Environmental Measurement Information

Recra LabNet Philadelphia **Analytical Report** **REVISION**

Client: TNU-HANFORD B99-078

RFW #: 9910L501

SDG/SAF #: H0590/B99-078

W.O. #: 10985-001-001-9999-00

Date Received: 10-23-99

SEMIVOLATILE

This narrative was corrected to add the TIC search for Tributylphosphate.

Eight (8) soil samples were collected on 10-21-99.

The samples and their associated QC samples were extracted on 10-28-99 and analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8270B for TCL Semivolatile target compounds on 11-03,04,05-99.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

- 1. The cooler temperatures upon receipt have been recorded on the chain-of-custody.
- 2. The required holding times for extraction and analysis were met.
- 3. Non-target compounds were detected in the samples.
- 4. Sample B0WMD4 required a 5-fold dilution due to high levels of both target and non-target compounds.
- 5. All surrogate recoveries were within EPA QC limits.
- 6. All matrix spike recoveries were within EPA QC limits.
- 7. All blank spike recoveries were within EPA QC limits.
- 8. The sample was spectrally searched for Butylated Hydroxytoluene and Tributylphosphate; however, they were not identified in the samples.

J. Michael Taylor

01-17-00 Date

Vice President

Philadelphia Analytical Laboratory

som\gorup\data\bna\tnu10501.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 21 pages.

A12

000018

•	Bechtel Hanfor	tel Hanford Inc. CHAIN OF CUSTODY/SAMPLE ANAL									В	99-078-144	Page 1	of i
	Collector Bowers/Trice			pany Contact hris Cearlock	Telephi 372-				Project Coordi TRENT, SJ	estor	Price Code	8N	Data Te	irneround
	Project Designation 200 Area Source characteri	zation - 200-CW-I OI		pling Location DO B pond					SAF No. B99-078				45	Days
	See Chest No. 99 D		Field	Logbook No.					Method of Ship FED EX	ment				
٠,	And the second			ite Property No					Bill of Lading		<u>. </u>	· · · · · ·		
	TMARECRAS AS 10.	-31-97							N/ p			e == 2		
				η		1	т		CON B	<u> </u>	$\frac{\omega_1}{\omega_1}$	5716	-	
	POSSIBLE SAMPLE HAZ	ARDS/REMARKS		Preservation	None	Coel 4C	None	Cool 4	C Cool 4C	Cool 4C	None			
			44	Type of Container	-0	эG	#G	aG.	0.	#G	₽G		•	
		•		No. of Container(s)	1	1	1	1			i			
	Special Handling and/or Stu	orage		Volume	60mL	250mL	250mL	500ml	. SOOmL	.1000mL	1000ml			}
000		SAMPLE AN	ALYSIS		loxopic Urraium	VOA - 8260A (TCL); VOA - 8260A (Add- On) [1- Proyentl, Ethern!)	pH (Soil) - 9045	See item (1 Special Instruction	BETTON (TCL);	See item (2) Special Instructions	in See item (3) Special Jestrections	1 :		
10	Sample No.	Matrix *	Sample Date	Sample Time						A Section			Minney 1	No. of the last
اما	BOWMD)	Soil	10-21-	19 1012		χ	Х	Х	X	Χ		BowgT		
k [BOWMD2	5071.	10-01-9	7 1017		У		У	У	У		Bower	9	
ĸ	BOWMD3	501)	10-91,1	7 1047			X		X	<u> </u>	<u> </u>	Boway	<i>P</i>	
- 1	BOWADY	5-11	10-01-9		KF-			<u> </u>	1 X 1	<u> </u>	<u> </u>	Bonsh		2 0 1.4
•	BOWMDS	501	10-01-90	7-1118-	0 - 2 - 19	KPECI	AL INSTRI	CTION	- - 	>		Bound	Matrix	SAMILUM
	CHAIN OF POSSESSION	·	. Sign/Prid	nt Names		See cha	in of custody	compuents	on SAF B99-078.	,		[Soil Weter	}
	clinquished By 0047 0040 Doug Bourn 10 clinquished By	75 Date/Time - 21 - 18/14/00 Date/Time	Received By A pf 3 (Received By	- 10-21-19/1	estime S	Seleniu Vunadii (2) NO	=, Silver}; IC um, Zinc}; Me 12/NO3 - 353.1	P Metals - roury - 741 ; IC Anice	race) (Arsenic, Ba 6010A (Supertrace 71 - (CV); Chromic 15 - 300.0 (Chlorid	: Add-On) { sm Hex - 7 l ie, Fluoride,	Beryllium, Ca 196 Nitrate, Nitrit	pper, Nickel,	Vapor Other Solid Other Liquid	
	Ref 3 C - 10-2 elinquished By	2.99 B800	Received By	KENLEY	10 27 5	Sulfate (3) Gar	nma Spectrose	opy (Cesi	uria - 350.3; Total um-137, Cobalt-60	, Europium	-152, Ewropius			1
	PAUL REPHOND DOWN FROM FOR								Add-on (Americiu pic Phatonium; Iso				•	. {
ľ	etiografished By 1	3/59 /200	Received By	S 10-27-79	1000			•				[•	1
A	LABORATORY Received By SECTION			ρ	Title							Dal	e/Time	
	FINAL SAMPLE Disposel Me	ethod					Dispose	d By				Del	e/Time	

._

	d Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST B99-078-145 Company Contact Telephone No. Project Coordinator Price Code 9N									Page 1	of 1
Collector Bowers/Trice		•	Company Contact Chris Cearlock	Telepho 372-9	ne No. 574	•		Project Coordi TRENT, SJ	nator	Price Code	8N	Data Te	urneround
Project Designation 200 Area Source character	ization - 200-CW-1 OU		iampling Location 200 B pond					SAF No. B99-078				45	Days
Ice Chest No. 96	·625	F	ield Logbook No. EL-1511					Method of Ship FED EX	ment				<u></u>
Shipped To TMA/RECRA	-21.29		Offsite Property No. O &	op t	<u> </u>			Bill of Lading/	4 F BIII N	795	3 &	196	6
·						•		COA B2	00	n16	7/6		
POSSIBLE SAMPLE HAZ	ARDS/REMARKS		Preservation	None	None	None	None	Coat 4C	None	Cool 4C	Cool 4C	Cool 4C	None
			Type of Container	₽G	∌G	•G	∌G	aG .	∌G	aG	aG	»G	øG
Special Handling and/or St	orage	•	No. of Container(s) Volume	60mL	l 60mL	l 60mL	1 120mL	1 250mL	1 250m£	. 500ml.	500ml.	looomL	1000
	SAMPLE ANA	Lysis		lactopic Uranium	Nickel-4)	Technodum-99	Tribbana - I	13 VOA - 8260A (TCL); VOA - 8260A (Add- On) {1- Propend, Ethenol}	pH (Soif) 9045	- See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - 8082	See item (2) in Special Instructions.	See item (' Special fastractio
Sample No.	Matrix •	Sample D	Nate Sample Time		() () ()				· · · >;				-
Howy 16	Soil	10-2	-99 1130						X_	<u> </u>	<u> </u>	<u> </u>	
Bommo7	5-11.		198 1140					X		<u> </u>	X	Х	
Bo mm DR	50,1	10-71-	97 1150					 }	_X	\\\\\	X	<u> </u>	
					SPEC	IAL INSTRU	CTIONS					Matrix	•
CHAIN OF POSSESSION		Received By	Print Names Date 2 / 10 2 / 1	e/Timic	(1) 10	usin of custody c CP Metals - 6010.	omments o	on SAF B99-078. race) {Arsenic, Bu 5010A (Supertrace	rium, Cade : Add-On)	nium, Chromium (Beryllium, Cop	, Lead, er, Nickel,	Sail Water Vapor	
linguisted By	0-2)-99/1406 Date/Time 99/0800	Received By	A/RIKKI Thorem	7700 1700.94 100.94	(2) N Sulfate (3) G	02/NO3 - 353.1; e}; Sulfides - 903 arama Spectrosco	C Anion: 30; Ammo ppy (Cesiv	1 - (CV); Chromis s - 300.0 (Chlorid nin - 350.3; Total (nm-137, Cobalt-60	e, Fluoride Cyanide - ! , Europius	i, Nitrate, Nitrite, 9010 n-152, Europium-	154,	Other Solid Other Liquid	
inquished By	1450 Date/Time	Received By	DEK	e/Time	Total I Ameri	ium-155); Gann Uranium (Uraniu cium-241 e 1) OW	m); (sotoj	Add-on (Americiu pic Plutonium; Iso	m-241); S topic Thon	rontum-29,90 ium (Thorium-23	2);		
ABORATORY Received By		VOGO /	Carrier Wart	Title		· <u>v -</u> · ·	<u>u -/ </u>		١٥٤	-1//	De	le/Time .	

シ	Bechtel Hanfor	d Inc.		CHAIN OF CUS	TODY	SAMPLI	E ANAL	YSIS	REQUES	r	B9	9-078-144	Page 1	of Ţ
	Collector Bowers/Trice	······································		empany Contact Chris Cearlock	Telepho 372-	one No. 9574			Project Coordi TRENT, SJ	nator	Price Code	8N		bruoreart
	Project Designation 200 Area Source characteri	zation - 200-CW-1 OU	Sa	mpling Location 200 B pond					SAF No. B99-078		•		45	Days
	Ice Chest No. EPC 96	· 025	Fie	eld Logbook No.		 _			Method of Ship FED EX	ment				<u> </u>
	Shipped To	11-19	Off	Isite Property No. Aのりの	00	5 <u>5</u>			Bill of Lading/	Air Bill No	795	3	000	lolo
Ì	· · · · · · · · · · · · · · · · · · ·	·]	COA BO	200	البرا	67	10	·
]	POSSIBLE SAMPLE HAZ	ARDS/REMARKS		Preservation	None	Cool 4C	None	Cool 40	Cool 4C	Cool 4C	None			
- {		·		Type of Container	aG.	.aG	aG	∌G	aG	₽G	≇G			
l				No. of Container(s)	1	1	1	1	1	1	1			
ľ	Special Handling and/or Sto	orage		Volume	60mL	250mL	250mL	500mL	S00mL	1000ml.	1000mL]		
00002	·	Sample analysis			Isotopic Urașium	VOA - \$260A (TCL); VOA - \$260A (Add- On) {I- Propunol, Ethauti}	Americations.	8270A (TCL);	See item (2) i Special January	in Ser item (1) in Special Instructions.				
2	Sample No.	Matrix *	Sample Date	te Sample Time		194.0								
, [.	Bown n1	A Sail	10.21-	1/_	X							Boy	979	1010
1	 	2501	1000	19 1017	X						X	Boy	عصيدي د	Ī9
ζ	ROWMD3 D	1501	10-01	11 1047	λ,				 		20.00	Don	qwo	
نا ٠	30mm 04	5011	10-91.	29 1102						PY.	X		19WO	
• /	Bowmps	501	10-91.	77 1119		EDECI	AL INSTRU	CTIONS				Bow	MD9 Matrix	
1	CHAIN OF POSSESSION		Sign/Pr	riat Names					on SAF B99-078.]	Soil Soil	
1)	linquished By Doces Bowellinquished By	10-21-57/140 Date/Timy 23 49/0800	Received By	3C 10-21-99	1/400 Time 9 /086	Seleniu Vanadi (2) NO Sulfate	m, Silver}; ICi um, Zinc}; Me IZ/NO3 - 353.I }; Sulfides - 90	P Metals - (rcury - 747 ; IC Anion (30; Ammo	nce) (Arsenic, Ba 5010A (Supertrace 1 - (CV); Chromin s - 300.0 (Chlorid nie - 350.3; Total im-137, Cobalt-60	: Add-On) (i _{ion} Hex - 71 e, Fluoride, Cyanide - 90	Beryllium, Copp 96 Nitrate, Nitrite, 1 110	Phosphate,	Water Vapor Other Solid Other Eliquid	
THE STATE OF THE S	inquisited By IKKI The	Date Time	Received By Received By	Date Cochan	VTime	Europia Total U	m-155); Gam	na Spec - /	Add-on (Americius pic Plutonium; lao	m-241}; Str	ontium-89,90	Total Sr;		
1	ABORATORY Received By	02399 1000	VILLA /C	1023A	Titk							D	ec/Time	
	SECTION INAL SAMPLE Disposal Me	shod	 				Dispose	d By	<u></u>			Da	te/Time	
	DISPOSITION				•			. •						

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	А	В	0	D	E
PROJECT: 2	CC-(w-		DATA PACKAGE	: HC59	σ
VALIDATOR:		LAB: REC		DATE: 2	30
CASE:		•	SDG: H	590	
		ANALYSES	PERFORMED	,,,	
CLP Volatiles	SW-846 8240 (cap column)	SW-846 8260 (packed column)	CLP Semivolatiles	SW-846 8270 (cap column)	SW-846 (packed column)
			0		
SAMPLES/MATR	IX Bow	MPI (1000 M D 2	Bowns	>3
	Boun	adu Bo	wws5	Bound	4
	Bown	107 B	own Dq		
					oal
1. DATA PACK Is technical Is a case nar Comments:		documentation			res No N/A
2. HOLDING T Are sample ho Comments:	lding times a	•		(Yes No N/A

000023

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION	
Is the GC/MS tuning/performance check acceptable? Yes	No (N/A
Are initial calibrations acceptable? Yes	No N/A
Are continuing calibrations acceptable? Yes	No N/A
Comments:	
4. BLANKS	-
Were laboratory blanks analyzed?	No N/A
Are laboratory blank results acceptable?	No N/A
Were field/trip blanks analyzed? Yes	(No) N/A
Are field/trip blank results acceptable? Yes	No (N/A)
Comments:	
5. ACCURACY	
Were surrogates/System Monitoring Compounds analyzed? Yes	No N/A
Are surrogate/System Monitoring Compound recoveries acceptable?	No N/A
Were MS/MSD samples analyzed?	No N/A
Are MS/MSD results acceptable?	NO N/A
Comments: pentachlanghal 6676 (MS)	<u> </u>
1,4 cheloralizare (6370 (U5) 6770 (US	<u>D)</u>
2- Chlaraphered (470 (Ms) 6970)	
phanel 50 " (6' ''	
<u> </u>	
·	
<u> </u>	

000024

GC/MS ORGANIC DATA VALIDATION CHECKLIST

PRECISION	
MS/MSD RPD values acceptable? Yes	No N/A
field duplicate RPD values acceptable? Yes	No A
field split RPD values acceptable? Yes	No (N/A)
ents: $D1/D2 - lc$	
SYSTEM PERFORMANCE	· · · · · · · · · · · · · · · · · · ·
internal standards analyzed? Yes	No NA
internal standard areas acceptable? Yes	No N/A
internal standard retention times acceptable? Yes	No N/A
COMPOUND IDENTIFICATION AND QUANTITATION ompound identification acceptable? Yes ompound quantitation acceptable? Yes ents:	No N/A
REPORTED RESULTS AND QUANTITATION LIMITS	
results reported for all requested analyses? Yes	No N/A
all results supported in the raw data? Yes	NO META
esults meet the CRQLs? Yes	NO NYA
	No ATA
	field duplicate RPD values acceptable? Yes field split RPD values acceptable? Yes ents: DI/DZ c SYSTEM PERFORMANCE internal standards analyzed? Yes internal standard areas acceptable? Yes internal standard retention times acceptable? Yes ents: COMPOUND IDENTIFICATION AND QUANTITATION ompound identification acceptable? Yes ompound quantitation acceptable? Yes ents: REPORTED RESULTS AND QUANTITATION LIMITS results reported for all requested analyses? Yes all results supported in the raw data? Yes

W 000025

Date:

15 February 2000

To:

Bechtel Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project: 200 Area Source Characterization - 200-CW-1 Operable Unit

Subject: Wet Chemistry - Data Package No. H0590-RLN (SDG No. H0590)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0590-RLN prepared by Recra LabNet (RLN). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
BOWMD1	10/21/99	Soil	С	See note 1
BOWMD2	10/21/99	Soil	С	See note 1
B0WMD3	10/21/99	Soil	С	See note 1
B0WMD4	10/21/99	Soil	С	See note 1
BOWMD5	10/21/99	Soil	С	See note 1
BOWMD6	10/21/99	Soil	С	See note 1
BOWMD7	10/21/99	Soil	С	See note 1
BOWMD8	10/21/99	Soil	С	See note 1

^{1 -} IC Anions - 300.0 chloride, fluoride, nitrate, nitrite, phosphate, sulfate); ammonia - 350.3; cyanide -9010B; pH - 9045; sulphide - 9030B; chromium-VI - 7196A; nitrate/nitrite - 353.2.

Data validation was conducted in accordance with the BHI validation statement of work and the 200-CW-1 Operable Unit RI/FS Work Plan and 216-B-3 RCRA TSD Unit Sampling Plan, DOE/RL-99-07, Draft B. Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times are assessed to ascertain whether the holding time requirements have been met by the laboratory. The holding time requirements are as follows: 30 days for chromium VI; 28 days for ammonia, nitrate/nitrite and IC anions (chloride, fluoride, and sulfate); 14 days for cyanide; 7 days for sulfide; 2 days for IC anion (phosphate, nitrate and nitrite); and immediate for pH.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Holding times were met for all analytes.

Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the CRQL to be acceptable.

All method blank results were acceptable.

Accuracy

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 30% and a sample value below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All matrix spike recovery results were acceptable.

Precision

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 30% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the PQL/CRQL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the PQL/CRQL and the sample concentration is less than five times the PQL/CRQL, all associated sample results are qualified as estimated and flagged "J/UJ".

All laboratory duplicate results were within the required control limits.

Field Duplicate Samples

One pair of field duplicate samples (samples BOWMD1/BOWMD2) were submitted to RLN for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the CRDL to ensure that laboratory detection levels meet the required criteria. The following reported detection limits were above the CRDL: Fluoride and nitrite in all samples and ammonia in samples BOWMD2, BOWMD3, BOWMD5, BOWMD6, BOWMD7 and BOWMD8. Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific CRDL.

Completeness

Data Package No. H0590-RLN (SDG No. H0590) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following reported detection limits were above the CRDL: Fluoride and nitrite in all samples and ammonia in samples BOWMD2, BOWMD3, BOWMD5, BOWMD6, BOWMD7 and BOWMD8. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-99-07, Draft B, 200-CW-1 Operable Unit RI/FS Work Plan and 216-B-3 RCRA TSD Unit Sampling Plan.

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WHC procedures are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision-making purposes.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value.
 The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0590	REVIEWER: TLI	DATE: 2/15/00	PAGE_1_OF_1_
COMMENTS: No qualifier:	s assigned		
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
		•	

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD																	
Laboratory: Recra LabNet																	
Case	SDG: I	H0590															
Sample Number		BOWMD1		BOWMD2		BOWMD3		BOWMD4		BOWMD5		BOWMD6		BOWMD7		BOWMD8	
Location		B Pond		B Pond		8 Pond		B Pond		B Pond		B Pond		B Pond		B Pond	
Remarks				Duplicate													
Sample Date		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99	
General Chamistry	CRDL	Result	a	Result	Q	Result	Œ	Result	σ	Result	a	Result	Q	Result	a	Result	a
Chloride	2	5.4		5.8		3.5		8,3		3.0		3.1		2.6		2.4	
Fkuoride	1	2.7	υ	2.7	U	2.7	υ	2.8	Ų.	2.6	u	2.7	U	2.6	U	2.6	IJ
Nitrite	1	1.4	υ	1.3	U	1.4	υ	1.4	υ	1.3	v	1.4	υ	1.3	U	1.3	v
Nitrate	0.2	170		180		140		330		85		39		8.8		1,6	_
Cyanide	1	0.54	U	0.54	U	0.54	U	0.56	حا	0.53	U	0.54	U	0.52	U	0.52	U
Phosphate by IC	6	2.2		2.1	<u> </u>	2.7		1.4	U	1.9		1.8		1.3	U	1.3	U
Chromium VI	0.7	0.43	U	0.43	U	0.65	٥	0.45	دا	0.42	U	0.44	υ	0.42	U	0.42	υ
Sulfate by IC	10	88.1		107		84.7		678		105		9.5		4.8		2.8	
Nitrate/Nitrite	I	37.5		35.8		22.0		70.7		20.9		8.6		2.0		0.31	
Ammonia	0.5	1.5		1.3	U	1.3	حا	2.1		1.3	5	1.3	υ	1.3	U	1.3	U
рН*		8.0	Г	8.0	Г	8,1		7.5		8.8		8.5		8.7		8.6	
Sulfide	20	4.2		4.2		4.2		4.2		2.1	د	2.2	U	2.1	U	3.9	
										•							
* - Units are pH units																	
										}							
																	Ĺ
											_						
							_								_		-

DOUGL

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/06/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9910L501

WORK	OPDED.	10985-001-001-9999-00	

					reporting	DILUTION
Sample	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	FACTOR
******	************	**************	*****	*****	*********	******
-001	BOWMD1	% Solids	92.2	•	0.01	1.0
		Chloride by IC	5.4	MG/KG	2.4	1.0
		Fluoride by IC	2.7 u	MG/KG	2.7	1.0
		Nitrite by IC	1.4 u	MG/KG	1.4	1.0
		Nitrate by IC	170	MG/KG	6.0	5,0
		Cyanide, Total	0.54 u	MG/KG	0.54	1.0
		Phosphate by IC	2.2	MG/KG	1.4	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
		Sulfate by IC	88.1	MG/KG	6.8	\$.0
		Nitrate Nitrite	37.5	MG/KG	2.1	10.0
		Ammonia, as N	1.5	MG/KG	1.3	1.0
		pH	a. o	SOIL PH	0.01	1.0
		Sulfide	4.2	MG/KG	2.2	1.0
-002	BOWND2	• Solids	92.6		0.01	1.0
		Chloride by IC	5.8	MG/KG	1.3	1.0
		Fluoride by IC'	2.7 u	MG/KG	2.7	1.0
		Nitrite by IC	1.3 u	MG/KG	1.3	1.0
		Nitrate by IC	180	MG/KG	6.7	5.0
		Cyanide, Total -	0.54 u	MG/KG	0.54	1.0
		Phosphate by IC	2.1	MG/KG	1.3	1.0
		Chromium VI	0.43 น	MG/KG	0.43	1,0
		Sulfate by IC	107	MG/KG	6.7	3.0
		Nitrate Nitrite	35.8	MG/KG	2.1	10.0
		Ammonia, as H	1.3 u	MC/KG	1.3	1.0
		pH	8.0	SOIL P	0.01	1.0
		Sulfide	4.2	MG/KG	2.2	1.0
-003	BOMMD3	* Solida	92.0	•	0.01	1.0
		Chloride by IC	3.5	MG/KG	1.4	1.0
		Fluoride by IC	2.7 u	MG/KG	2.7	1.0
		Nitrite by IC	1.4 u	MG/KG	1.4	1.0
		Nitrate by IC	140	MG/KG	6.8	5.0
		Cyanide, Total	0.54 u	MG/KG	0.54	1.0
		Phosphate by IC	2.7	MG/KG	1.4	1.0
		Chromium VI	0.65 u	MG/KG	0.65	1.0
		Sulfate by IC	84.7	MG/KG	6.8	5.0
		Nitrate Nitrite	22.0	MG/KG	2.2	10.0
		Ammonia, as N	1.3 u	MG/KG	1.3	1.0
		PH	8.1	soil P	H 0.01	1.0

2/11/00

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/06/99

CLIENT: TNU-HANFORD B99-078

RECRA LOT #: 9910L501

WORK	ORDER:	10985-001-001-9999-00	

	EK: 10988-001-001-9999-	••			REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	LINIT	FACTOR
	************		******	*****	*********	*******
-003	BOWND3	Sulfide	4.2	MG/KG	. 2.2	1.0
-004	BOWMD4	* Solids	19.5	•	0.01	1.0
		Chloride by IC	1.3	MG/KG	1.4	1.0
		Pluoride by IC	2.8 u	MG/KG	2.8	1.0
		Nitrite by IC	1.4 u	MG/KG	1.4	1.0
		Nitrate by IC	330	MG/KG	28	20
		Cyanide, Total	0.56 u	MG/KG	0.56	1.0
		Phosphate by IC	1.4 u	MG/KG	1.4	1.0
		Chromium VI	0.45 u	MG/KG	0.45	1.0
		Sulfate by IC	678	MG/KG	27.9	20.0
		Nitrate Nitrite	70.7	MG/KG	5.5	25.0
		Ammonia, as N	2.1	MG/KG	1.4	1.0
		PH	7.5	SOIL PH	0.01	1.0
		Sulfide	4.2	MG/KG	2.2	1.0
-005	BOWNDS	4 Solida	94.6	•	0.01	1.0
		Chloride by IC	3.0	MG/KG	1.3	1.0
		Fluoride by IC	2.6 u	MG/KG	2.6	1.0
		Nitrite by IC .	1.3 u	MG/KG	1.3	1.0
		Nitrate by IC	6\$	MG/KG	6.6	5.0
		Cyanide, Total	0.53 u	MG/KG	0.53	1.0
		Phosphate by IC	1.9	MG/KG	1.3	1.0
		Chromium VI	0.42 u	MG/K G	0.42	1.0
		Sulfate by IC	105	MG/KG	6.6	5.0
		Nitrate Nitrite	20.9	MG/KG	2.0	10.0
		Ammonia, as N	1.3 u	MG/KG	1.3	1.0
		рH	1.1	SOIL P	0.01	1.0
		Sulfide	2.1 u	MG/KG	2.1	1.0
-006	BOWND6	* Solids	91.9	•	0.01	1.0
		Chloride by IC	3.1	MG/KG	1.4	1.0
		Fluoride by IC	2.7 u	MG/KG	2.7	1.0
		Nitrite by IC	1.4 u	MG/KG	1.4	1.0
		Nitrate by IC	39	MG/KG	1.4	1.0
		Cyanide, Total	0.54 u	MG/KG	0.54	1.0
		Phosphate by IC	1.8	MG/KG	1.4	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
		Sulfate by IC	9.5	MG/KG	1.4	1.0
		Nitrate Nitrite	1.6	MG/KG	0.21	1.0

211/00

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 12/06/99

CLIENT: TNU-HANFORD B99-078
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9910L501

					reporti ng	dilution
Sample	SITE ID	ANALYTE	RESULT	UNITS	LIMIT	PACTOR
*==***	*************		******		*********	*******
-006	BOWMD6	Ammonia, as N	1.3 u	MG/KG	. 1.3	1.0
		pH	8.5	SOIL PH	0.01	1.0
		Sulfide	2.2 u	MG/KG	2.2	1.0
-007	BOWMD7	* Solids	96.2	•	0.01	1.0
		Chloride by IC	2.6	MG/KG	1.3	1.0
		· Fluoride by IC	2.6 U	MG/KG	2.6	1.0
		Nitrite by IC	1.3 u	MG/KG	1.3	1.0
		Nitrate by IC	8.8	MG/KG	1.3	1.0
		Cyanide, Total	0.52 u	MG/KG	0.52	1.0
		Phosphate by IC	1.3 u	MG/KG	1.3	1.0
	•	Chromium VI	0.42 u	MG/KG	0.42	1.0
		Sulfate by IC	4.8	MG/K G	1.3	1.0
		Nitrate Nitrite	2.0	MG/KG	0.20	1.0
		Ammonia, as N	1.3 u	MG/KG	1.3	1.0
		рH	8.7	SOIL PH	0.01	1.0
		Sulfide '	2.1 u	MG/KG	2.1	1.0
-008	BOWMDB	♦ Solids	95.9	•	0.01	1.0
		Chloride by IC .	2.4	MG/KG	1.3	1.0
		Pluoride by IC	2.6 u	MG/KG	2.€	1.0
		Nitrite by IC	1.3 u	MG/KG	1.3	1.0
		Nitrate by IC	1.6	MG/KG	1.3	1.0
		Cyanide, Total	0.52 u	MG/K G	0.52	1.0
		Phosphate by IC	1.3 u	MG/KG	1.3	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Sulfate by IC	2.8	MG/KG	1.3	1.0
		Nitrate Nitrite	0.31	MG/KG	0.21	1.0
•		Ammonia, as N	1.3 u	MG/KG	1.3	1.0
		рн	1.6	SOIL P	0.01	1.0
		Sulfide	3.9	MG/KG	2.1	1.0

N (11 (00)

Laboratory Narrative and Chain-of-Custody Documentation



Chemical and Environmental Measurement Information

Recra LabNet Philadelphia **Analytical Report**

Client: TNU-HANFORD B99-078

W.O. #: 10985-001-001-9999-00

Date Received: 10-23-99

RFW#: 9910L501-SDG#: H0590

SAF#: B99-078

INORGANIC CASE NARRATIVE

- 1. This narrative covers the analyses of 8 soil samples.
- 2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.
- 3. Sample holding times as required by the method and/or contract were met.
- 4. The cooler temperatures were recorded on the chain-of-custody.
- 5. The method blanks were within method criteria.
- 6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.
- 7. The matrix spike recoveries were within the 75-125% control limits.
- 8. The replicate analyses were within the 20% RPD control limit.
- 9. Results for solid samples are reported on a dry weight basis.

J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

пјр\i10-501

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 22 pages.

000015

	Bechtel Hanford	Inc.		CHAIN OF CUSTODY/SAM			AMPLE	EANAL	YSIS	REQUEST	r	B99-078-144		Page <u>i</u>	of T
	Collector Bowers/Trice		C		ry Contact Cenrlock	Telepho 372-9				Project Coordi TRENT, SJ	патог	Price Code	8N	Data Tu	rnaround
	Project Designation 200 Area Source characteriza	ntion = 200-CW-LOU	Si		g Location					SAF No. B99-078				45	Days
	lee Chest No		F	Field Loohook No.											
	CRC 99 01 Shipped To			EL-15	Property No.					FED EX Bill of Lading/	Air Rill N	io .			
{	TMA/RECRACT AS 10-	21-97			NA	•			ĺ	N/F		•••			
{										COA BZ	20C	W16	571c	-	
	POSSIBLE SAMPLE HAZA	RDS/REMARKS			Preservation	None	Cool 4C	None	Cool 40	Cool 4C	Cool 40	None			
-					Type of Container	₽G	∍G	#G	aG	aG	∌G	₽G			
ļ		·			No. of Container(s)	t	! -			_	I				
	Special Handling and/or Stor	rage			Volume	60mL	250mL	250mL	500ml	. 500mL	1000mi	L 1000mL			
		SAMPLE ANA	LYSIS			factopis Uranium	VOA - \$260A (TCL); VOA - \$260A (Add- On) (1- Propenol, Ethanol)	pH (Soil) - 9045	See item (1 Special Instruction	8270A (TCL);	See item (2) Special Instruction	Special			
Si	Sample No. *	Matrix •	Sample Di	ate	Sample Time						1			a land	
T L	BOWMOI	Soil 1	10-21	- 79	1012		Х	χ.	Х	X	χ		BowgT	9	
	BOW MD2	Soyli	10-01	197	1017		Y	\	Х	Х	Y		Bower	9	
	BOWMD3	501	16-01	17	1047	 	Y	Х	À	Х	<u> </u>	· [Bowgy	0	
	BOWMD4	501	16-01	99	1107		, Y		Ý	Х	<u> </u>		Banga		8.0
F	BOWMDS	501	10-01-	99-	1118	KF	- X -	- X -	X	 	<u>\</u>	<u> </u>	Bowy	9 K	SAMPLES
	CHAIN OF POSSESSION		.Sign/I	Print N	lames	0-279	SPECI See cha	AL INSTRI		S on SAF B99-078.	/			Matrix Soil	•
は成りま	clinquished By 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	21-19/1400 Date/Time	Received By)C	10-11-19)		Seteniu Vanadi (2) NC Sulfate (3) Ge Europii Todal U Americ	im, Silver); 10 um, Zinc}; Mo 2/NO3 - 353.); Sulfides - 90 mma Spectros un-155); Gam	P Metals - ercury - 74 1; IC Anios 030; Ammo copy (Cesi ima Spec -	race) (Arsenic, Ba 6010A (Supertrace 71 - (CV); Chromi as - 300.0 (Chlorid onia - 350.3; Total um-137, Cobalt-60 Add-on (Americiu pic Plutonium; Iso	e Add-On) um Hex - 7 le, Fluoride Cyanide -), Europiun um-241); S	{Beryllium, Cop 1196 s, Nitrate, Nitrite, 9010 n-152, Europium trontium-89,90 -	pper, Nickel, , Phosphate, -154, - Total Sr; 32];	Water Vapor Other Solid Other Liquid	
1	ABORATURY Received By SECTION					Tid		<u> </u>							
	INAL SAMPLE Disposal Met DISPOSITION	hod						Dispose	ed By			·	Dat	e/Time	

Bechtel Hanford Inc.		СНА	IN OF CUST	CODY/S	AMPL)	E ANAL	YSIS	REQUES	r	B9 9	0-078-145	Page <u>I</u>	of <u>1</u>	
Collector Bowers/Trice		Company Chris Co		Telepho 372-9				Project Coordi TRENT, SI	nator	Price Code	8N	Data Tu	rasround	
Project Designation		Sampling		712-3				SAF No. 45				45	Days	
200 Area Source characterization - 200-CW-1 OU 200 B pond Ice Chest No. Field Logbook No.								B99-078						
ERC 96.025	Ś	EL-1511			٠			Method of Ship FED EX	bucut					
Shipped To TMA/RECRA		Offsite Pro	bperty No. O Q	y Ø	<u> </u>			Bill of Lading/	Air Bill No	195	3 <i>Q</i>	1961	9	
								COA B2	004	16	7/C			
POSSIBLE SAMPLE HAZARDS/REMAI	RKS		Preservation	None	None	None	None		None	Cool 4C	Cool 4C	Cool 4C	None	
		T	ype of Container	∌G	aG	aG	åG	aG	aG	aG	∌G	" G	aG	
•	,	N	o. of Container(s)	1		1 .	1	i	1	1	'	<u> </u>	-	
Special Handling and/or Storage			Volume	60mL	60mi.	60mL	120mI		250mL	500mL	500mL	1000mL	1000mL	
SAMPL	E ANALYSIS			Isotopic Uranium	Nickel-63	Tochasius 99	Tritium - 1	H3 VOA - 1260A (TCL); VOA - 1260A (Add- On) (1- Propenol, Ethangi)	pH (Soil) - 9045	See item (1) in Special Instructions.	Semi-VOA - \$270A (TCL); TPH-Diesel Range - WTPH-D; PCBs - \$082	See item (2) in Special Instructions.	See item (3) in Special Instructions	
Sample No. Matrix	Samp	le Date	Sample Time					ACCOR				REMENT		
Aony Db soil	1000	1-99	1130		The second second			X	Y,	X	V	Χ		
80 WM 107 50.1)	10-3	1 '96	1140					X	-/	X	Ŷ	X		
no mm DR Soil	10-7	1-97	1150					V	X	\X	У	X		
	<u> </u>						· ————	-{						
CIIAIN OF POSSESSION		ga/Print Na			See cl		comments	on SAF B99-078.				Matrix Soil Water	•	
clinquisted By . Date/Time	Received R. The Land	F 3C IBY WANTERE	10-21-99/	e/Time /400 e### 94 e/Time	Scleni Vanad (2) N Sulfate (3) Ga Europi Total	um, Silver); ICi ium, Zinc }; Me O2/NO3 - 353.1 :}; Sulfides - 90 imma Spectrosc um-)55}; Gam Jranium (Urani	P Metals - reury - 74° ; IC Anior 30; Ammo opy {Cesi ma Spec -	trace) (Arsenic, Bi 6010A (Supertrace 71 - (CV); Chromi ns - 300.0 (Chloric onin - 350.3; Total nun-137, Cobalt-60 Add-on (Americia opic Plutonium; Isc	e Add-On) { 'um 1 lex - 7 l 'le, Fluoride, Cyanide - 9), Europium- um-241}; Sti	Beryllium, Cop 196 Nitrate, Nitrite, 010 -152, Europium- contium-89,90	Phosphate, 154, Total Sr;	Vapor Other Solid Other Liquid		
inquished By Date/Time	Received - Q		Date Date 99	Time	l	cium-241 c Bow	801	oc TA	}- s1	.40				
ABORATORY Received By	200 July	Medant	7	Titk		, <u>p</u>	<u>v -/</u>		1106	ゲーー 501	Da Da	te/Time		
SECTION INAL SAMPLE Disposal Method DISPOSITION						Dispose	d By		, 101 0	<u> </u>	Da	te/Time	•	

Bechtel Hanford Inc.		CI	CHAIN OF CUSTODY/SAMPLE ANALYSIS REC					REQUEST	r	B99	-078-144	, c	
Collector Bowers/Trice			any Contact is Cearlock	Telepho 372-9				Project Coordi TRENT, SJ	nator I	rice Code	8N	Data Tu	rnaround
Project Designation	OR Sampling Location							SAF No.		•		45	Days `
200 Area Source characterization - 2 lee Chest No.	200-CW-1 OU		B pond ogbook No.		-			B99-078 Method of Ship					
ERC 96.0	<u> </u>	EL-	1511	•				FED EX					
Shipped To TMA/REPRA \$ 73 8-71"	<u> </u>	Offsite	Property No.	09	5			Bill of Lading/	<u>35</u>	195	3_	Ø9	660
••			· 					COA BE	300	الىر	67	<u>(2)</u>	
POSSIBLE SAMPLE HAZARDS/R	REMARKS		Preservation	None	Cool 4C	None	Cool 4	C Cool 4C	Cool 4C	None			
!		ľ	Type of Container	aG	.∎G	aG	вG	₽G	aG	aG			
	•	•	No. of Container(s)	1	1	1	1	1	l	l			
Special Handling and/or Storage			Volume	60mL	250mL	250mL	500ml	L 500mL	1000msL	1000mL			
000018	AMPLE ANALY	SIS		Isotopic Uranium ;	VOA - 8260A (TCL); VOA - 8260A (Add- On) [1- Propenol, Ethenol]	pH (Soil) - 9045	See Hem (1 Special Instruction	0270A (TCL);	See item (2) is Special Instructions.	See item (3) in Special Instructions.			
Sample No.	Matrix *	Sample Date	Sample Time										
Bourn)	(Soil)	0.21-9	8 1919	X						<u></u>	Boy	1979	1015
Bownsa os	0:1	D-2+19	1017	_X						I X	Bou	عصدور	<u> </u>
BOWMD3 XX &	51	0-21-11	1047						·	26.90	Dou	900	
BOWNDY S	0:1)	0-21.91	1)02					_	Dr.	X	Bon	one	
Bowmny 5	011	0-21-19	العررزا	<u>\</u>		i			, <u>-</u>	L X	Bou		
CHAIN OF POSSESSION		Sign/Print	Names		See ci		comments	on SAF B99-078.				Matrix Soil Water	•
House Bourns 10-21	.97/1400 ate/Time		C 10-21-7) KKIThoren Uai		Seleni Vanad	ium, Silver); IC tium, Zinc); M	P Metals -	trace) [Arsenic, Ba - 6010A (Supertrac 171 - (CV); Chromi ns - 300.0 (Chloric	e Add-On) (I um Hex - 71	Beryllium, Cop 96	·	Vapor Other Solid Other Liquid	
Linguished Byl KKI Thores	9/0800 me/time/	Received By	10.62.5	14/08/ e/Time	Sulfat (3) G	e); Sulfides - 9 amma Spectros	030; Amm copy (Ces	ionia - 350.3; Total ium-137, Cobalt-6 Add-on (Americis	Cyanide - 90), Europium-) 0 152, Europium	-154,		
Hippuished By D	19/1430 ate/fune	Received By	Cocon Cocon	e/Time	Total Ameri	Uranium (Uran cium-24)	ium }; lsot	opic Plutonium; Isc	topic Thoriu	nt (Thorium-2	32);		
LABORATORY Received By	79 1000	With Ken	10:2399	1000			· <u>··</u>				Da	ite/Time	
SECTION	: 		<u></u>			Diana	-4 Ov					te/Time	
INAL SAMPLE Disposal Method DISPOSITION				:	•	Dispos	zu Pý				. 174	vet 11111g	•

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

ממסובריד	А	В	(0)	D	E
PROJECT:	00-CW-	(DATA PACKAGE		
VALIDATOR:	tl(LAB: Rech	ノオ	DATE: 2/1	a
CASE:		•	SDG: Ho	590	
		ANALYSES	PERFORMED		
- CAnions/IC	□тос	□ TOX	□ ТРН-418.1	Oil and Grease	Alkelinity
Z Ammonia	O BOD/COD	☐ Chloride	☐ Chromium-VI	75-pH	יסעיסעסל.
☐ Sulfete	C) TOS	☐ TKN	☐ Phosphate	ACRUL	PRCUFICE
0	0	٥	0	Acyalde	
SAMPLES/MATE	RIX Boa	MDI S	3cmMD2	Beward	3
		MTY I	BOUNTY	Bound	5
	Ben	MIZE	BOUND7		
Is technical	AGE COMPLETENT verification rative presen	documentation			Yes No N/A

At 000020

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION		1 ()
Was initial calibration performed for all applicable analyses? Yes	No	N/A
Are initial calibration results acceptable? Yes	No	N/A
Was a calibration check performed for all applicable analyses? Yes	No	N/A
Are calibration check results acceptable? Yes	No	N/A
Comments:		ΔI
		
4. BLANKS		
Were laboratory blanks analyzed? Yes) No	N/A
	•	N/A N/A
Are laboratory blank results acceptable? Yes	No.	•
Were field/trip blanks analyzed? Yes	No No	N/A
Are field/trip blank results acceptable? Yes	но	N/A)
Comments:		
	<u> </u>	
		
5. ACCURACY		
Were spike samples analyzed at the required frequency? Yes	No	N/A
Are spike recoveries acceptable?	No	N/A
Were LCS analyses performed at the required frequency? Yes	Ng/	N/A
Are LCS recoveries acceptable? Yes	No7	N/A
Comments: Noz/vos etc		
		
6. PRECISION		
Were laboratory duplicate samples analyzed		
at the required frequency?	No	N/A
Are laboratory duplicate sample RPD values acceptable? Yes	No	N/A
Are field duplicate RPD values acceptable? Yes	No	N/A
Are field split RPD values acceptable? Yes	No	(H/A)

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments:
7. ANALYTE QUANTITATION Was analyte quantitation performed properly? Yes No N/A
Comments:
8. REPORTED RESULTS AND DETECTION LIMITS
Are results reported for all requested analyses? Yes No N/A
Are results supported in the raw data? Yes No N/A
Are results calculated properly? Yes No N/A
Do results meet the CRDLs? Yes No N/A
Comments: Floored - all h.tvike - all
armer - PZ, PS, DS, D6, D7, DS

·

Date:

15 February 2000

To:

Bechtel Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project: 200 Area Source Characterization - 200-CW-1 Operable Unit Subject: Inorganics - Data Package No. H0590-RLN (SDG No. H0590)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H0590-RLN prepared by Recra LabNet (RLN). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analys is
B0WMD1	10/21/99	Soil	С	See note 1
BOWMD2	10/21/99	Soil	С	See note 1
BOWMD3	10/21/99	Soil	С	See note 1
BOWMD4	10/21/99	Soil	С	See note 1
BOWMD5	10/21/99	Soil	С	See note 1
BOWMD6	10/21/99	Soil	С	See note 1
BOWMD7	10/21/99	Soil	С	See note 1
BOWMD8	10/21/99	Soil	С	See note 1

¹⁻ ICP metals by 6010B; mercury by 7471A.

Data validation was conducted in accordance with the BHI validation statement of work and the 200-CW-1 Operable Unit RI/FS Work Plan and 216-B-3 RCRA TSD Unit Sampling Plan, DOE/RL-99-07, Draft B. Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times for mercury and ICP metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within six (6)

months for ICP metals and 28 days for mercury.

All holding times were acceptable.

Blanks

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations (in ug/L) less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the IDL and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Accuracy

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 25% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike recovery of 34%, all silver results were qualified as

estimates and flagged "J".

Due to a matrix spike recovery of -120%, all detected mercury results were qualified as estimates and flagged "J" and all undetected mercury results were rejected and flagged "R".

Due to a matrix spike recovery of 4.7%, all lead results were qualified as estimates and flagged "J".

Due to a matrix spike recovery of 38.5%, all antimony results were qualified as estimates and flagged "J".

Due to a matrix spike recovery of 34%, all zinc results were qualified as estimates and flagged "J".

All other matrix spike recovery results were acceptable.

Precision

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 30% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ".

Due to an RPD of 43.4%, all lead results were qualified as estimates and flagged "J".

Due to an RPD of 35%, all silver results were qualified as estimates and flagged "J".

Due to an RPD of 30.2%, all barium results were qualified as estimates and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples BOWMD1/BOWMD2) were submitted to RLN for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. The RPDs for barium (31%), cadmium (57%) and mercury (59%)

were outside QC limits. Under the BHI statement of work, no qualification is required. All other field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the PQLs to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific PQL.

Completeness

Data package No. H0590 was submitted for validation and verified for completeness. The completion percentage was 97.5%.

MAJOR DEFICIENCIES

Due to a matrix spike recovery of -120%, all undetected mercury results were rejected and flagged ""R". Rejected data is unusable and should not be reported.

MINOR DEFICIENCIES

Due to an RPD of 43.4%, all lead results were qualified as estimates and flagged "J". Due to an RPD of 35%, all silver results were qualified as estimates and flagged "J". Due to an RPD of 30.2%, all barium results were qualified as estimates and flagged "J". Due to a matrix spike recovery of 34%, all silver results were qualified as estimates and flagged "J". Due to a matrix spike recovery of -120%, all detected mercury results were qualified as estimates and flagged "J". Due to a matrix spike recovery of 4.7%, all lead results were qualified as estimates and flagged "J". Due to a matrix spike recovery of 38.5%, all antimony results were qualified as estimates and flagged "J". Due to a matrix spike recovery of 34%, all zinc results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

BHI, MRB-SBB-A23665, Validation Statement of Work, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-99-07, Draft B, 200-CW-1 Operable Unit RI/FS Work Plan and 216-B-3 RCRA TSD Unit Sampling Plan.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making-purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0590	REVIEWER: TLI	DATE: 2/15/00	PAGE_1_0F_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Silver, lead, antimony, zinc	J	All ,	MS percent recovery
Lead, silver, barium	J	All	RPD
Mercury	J	BOWMD1, BOWMD2, BOWMD3, BOWMD4, BOWMD5	MS percent recovery
Mercury	R	BOWMD6, BOWMD7, BOWMD8	MS percent recovery

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

	,
)
	١
_	١
	ĺ
C	2

Laboratory: Recra Lak	Net			7													
Case	SDG: HO	590		1													
Sample Number		BOWMD1		BOWMD2		BOWMD3		B0WMD4		BOWMD5		B0WMD6	-	BOWMD7		BOWMD8	_
Location		B Pond		B Pond		8 Pond		B Pond		B Pond		B Pond		B Pond		B Pond	_
Remarks				Duplicate		"		1		1							
Sample Date		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99	
Inorganics	CRDL	Result	a		Q	Result	Q			Result	d	Result	Q	Result	Q	Result	10
Silver	2	8.4	J	7.6	J	0.13	J	0.27	J	0.18	٦,	0.08	เกา	0.07	บม	0.08	UJ
Arsenic	1	3.2		3.0		5.5		4.7		2.7		3.0		2.2		2.8	
Barium	1	108	3	79.0	J	87.6	J	84.2	J	61.5	7	101	<u>J_</u>	130	ī	70.3	J
Beryllium	0.2	0.31		0.30		0.32		0.31		0.26		0.40		0.24		0.28	T
Cadmium	0.04	0.47		0.26		0.04	U	0.04	U	0.04	ادا	0.04	Ū	0.03	U	0.04	U
Chromium	1	11.9		13.7		12.1		10.6		6.6		6,3		5.5		7.5	,
Copper	2	18.5		16.2		13.9		16.7		12.8		15.2		10.6		10.4	
Mercury	0.05	0.98	J	0.53	J	0.08	J	0.27	J	0.04	,	0.02	UR	0.02	UR	0.02	UR
Nickei	4	9.3		11.3		44.8		9.7		6,9		8.7		8.2		8.2	
Lead	20	139	5	163	J	14.4	j	22.2	J	14.9		3.7		3.0		3.4	J
Antimony		0.72	7	0.22	IJ	0.20	IJ	0.30		0.19	_	0.22		0.17		0.21	W
Selenium	20	0.43	٥	0.44	Ü	0.39	U	0.44	U	0.37	U	0.43	U	0.34	υ	0.41	U
Thallium		0.45	ح	0.74		0.68	Ĺ	0.59		0.39	U	0.71		0.53		0.75	_
Vanadium	3	52.0		55.9		67.4		58.7		54.5		89,5		58.2		67.3	_
Zinc	2	127	7	123	J	57.2	7	71.2	<u>J</u>	47.7	J	54.7	J	39.0	J	44.5	J
													<u> </u>		<u> </u>		
																	\vdash
													L_				<u> </u>
										l					L		1

INORGANICS DATA SUMMARY REPORT 11/18/99

CLIENT: THU-HANFORD B99-078

RECRA LOT #: 99101501

WORK ORDER: 10985-001-001-9999-00

				reporting	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT UNITS	LIMIT	FACTOR
	**********	****************	P02-0000 110-000		******
-001	BOWND1	Silver, Total		0.0	1.0
		Arsenic, Total	3.2 MG/KG	0.28	1.0
		Barium, Total	100 J MG/KG	0.02	1.0
		Beryllium, Total	0.31 MG/KG	° 0.03	1.0
		Cadmium, Total	0.47 MG/KG	0.04	1.0
		Chromium, Total	11.9 MG/KG	0.07	1.0
		Copper, Total	18.5 NG/KG	0.05	1.0
		Mercury, Total	0.98 Ј ма/ка	0.02	1.0
		Nickel, Total	9.3 _MG/KG	0.11	1.0
		Lead, Total	139 Унс/ко	0.22	1.0
		Antimony, Total	0.72 J NG/KO	0.22	1.0
		Selenium, Total	0.43 u MG/KG	0.43	1.0
		Thallium, Total	0.45 u NG/KG	0.45	1.0
		Vanadium, Total	52.0 Mg/Kg	0.06	1.0
		Zinc, Total	127 Ј ма/ка	0.05	1.0
-002	BOWNED2	Silver, Total .	7.6 5 Mg/Kg	0.09	1.0
		Arsenic, Total	3.0 MG/KG	0.29	1.0
		Barium, Total	79.0 J MG/KG	0.02	1.0
		Beryllium, Total	0.30 MG/KQ	0.03	1.0
		Cadmium, Total	0.26 MG/KG	0.04	1.0
		Chromium, Total	13.7 MG/KG	0.07	1.0
		Copper, Total	16.2 NG/KG	0.05	1.0
		Mercury, Total	. 0.53 T MG/KG	0.02	1.0
		Nickel, Total	11.3 NG/KG	0.11	1.0
•		Lead, Total	163 J NG/KG	0.22	1.0
		Antimony, Total	0.22 u Лис/ка	0.22	1.0
		Selenium, Total	0.44 u MG/KG	0.44	1.0
		Thallium, Total	0.74 HG/KG	0.46	1.0
		Vanadium, Total	55.9 NG/KQ	0.06	1.0
		Zinc, Total	123 ј жу/ка	0.05	1.0

2/11/00

INORGANICS DATA SUMMARY REPORT 11/18/99

CLIENT: THU-HANFORD B99-078 WORK ORDER: 10985-001-001-9999-00 RECRA LOT #: 9910L501

				REPORTING	DILUTION
SAMPLE	SITE ID	ANALYTE	RESULT UNITS	LIMIT	FACTOR
	2204222222200000000000		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		******
-003	BOMMO3	Silver, Total	0.13 J NG/KG	10.08	1.0
		Arsenic, Total	5.5 MG/KG	0.26	1.0
		Barium, Total	87.6 T MG/KG	0.02	1.0
		Seryllium, Total	0.32 MG/KG	° 0.03	1.0
		Cadmium, Total	0.04 u mg/KG	0.04	1.0
		Chromium, Total	12.1 Mg/KG	0.07	1.0
		Copper, Total	13.9 NG/KG	0.05	1.0
		Mercury, Total	0.00 J MO/KO	0.01	1.0
		Nickel, Total	44.8 NG/KO	0.1	1.0
		Lead, Total	14.4 J NO/KG	0.20	1.0
		Antimony, Total	0.20 u JHG/KG	0.20	1.0
		Selenium, Total	0.39 u MG/KG	0.39	1.0
		Thallium, Total	0.68 MG/KG	0.41	1.0
		Vanadium, Total	67.4 MG/KG	0.06	1.0
		Zinc, Total	57.2 J ng/kg	0.05	1.0
-004	вомир4	Silver, Total .	0.27 J NG/KG	0.09	1.0
		Arsenic, Total	4.7 MG/KG	0.29	1.0
		Barium, Total	84.2 J MG/KG	0.02	1.0
		Beryllium, Total	0.31 MG/KG	0.03	1.0
		Cadmium, Total	0.04 u Mg/KG	0.04	1.0
		Chromium, Total	10.6 Mg/Kg	0.08	1.0
		Copper, Total	16.7 MG/RG	0.05	1.0
		Mercury, Total	0.27 Ј на/ка	0.02	1.0
		Fickel, Total	9.7 Mg/Kg	0.11	1.0
		Lead, Total	22.2 Ј на/ка	0.23	1.0
		Antimony, Total	0.30 Ј на/ка	0.23	1.0
		Selenium, Total	0.44 u NG/KG	0.44	1.0
		Thallium, Total	0.59 Mg/KG	0.47	1.0
		Vanadium, Total	58.7 Mg/Kg	0.07	1.0
		Zinc, Total	71.2 J NG/KO	0.05	1.0

2/11/00 pr

INORGANICS DATA SUMMARY REPORT 11/18/99

CLIENT: THU-HANFORD B99-078

RECRA LOT #: 9910L501

REPORTING

DILUTION

WORK	ORDER	10985-00	11-001-	3337-44

				KELOKITMA	21201108
Sample	SITE ID	ARALYTE	RESULT UNITS	LINIT	FACTOR
******	***************	**************	********	********	*******
-005	BOWND5	Silver, Total	0.10 🏅 на/ка	0.07	1.0
		Arsenic, Total	2.7 MG/KG	0.25	1.0
	*	Barium, Total	61.5 J Ha/Ka	0.02	1.0
		Beryllium, Total	0.26 MG/RG	0.03	1.0
		Cadmium, Total	0.04 u Mg/Kg	0.04	1.0
		Chromium, Total	6.6 Mg/Kg	0.06	1.0
		Copper, Total	12.0 MG/KQ	0.05	1.0
		Mercury, Total	0.04 J MG/KG	0.02	1.0
		Nickel, Total	6.9 HG/KG	0.09	1.0
		Lead, Total	14.9 5 MG/KG	0.19	1.0
		Antimony, Total	0.19 и Тма/ко	0.19	1.0
		Selenium, Total	0.37 u MG/KG	0.37	1.0
	•	Thallium, Total	0.39 u NG/KG	0.39	1.0
		Vanadium, Total	54.5 MG/KG	0.05	1.0
		Zinc, Total	47.7 J MG/KG	0.05	1.0
-006	BOWNDE	Silver, Total .	0.08 u 5mg/kg	0.00	1.0
		Arsenic, Total	3.9 Mg/Kg	0.29	1.0
		Barium, Total	101 Јид/ка	0.02	1.0
		Beryllium, Total	0.40 MG/KG	0.03	1.0
		Cadmium, Total	0.04 u MG/KG	0.04	1.0
		Chromium, Total	6.3 Mg/Kg	0.07	1.0
		Copper, Total	15.2 MG/KG	0.05	1.0
		Mercusy, Total	. 0.02 ц вмд/ка	0.02	1.0
		Nickel, Total	8.7 Mg/Kg	0.11	1.0
		Lead, Total	3.7 5 ма/ка	0.22	1.0
		Antimony, Total	0.22 u Jmg/kg	0.22	1.0
		Selenium, Total	0.43 u Mg/Kg	0.43	1.0
		Thallium, Total	0.71 MG/KG	0.45	1.0
		Vanadium, Total	89.5 MG/KG	0.06	1.0
		Zinc, Total	54.7 Ј мс/ко	0.05	1.0

2/11/00

INORGANICS DATA SUMMARY REPORT 11/18/99

CLIENT: THU-HANFORD B99-078
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9910L501

				REPORTING	DILUTION
Sample	SITE ID	ANALYTE	RESULT UNITS	LIMIT	FACTOR
******	*******		·······	*********	******
-007	- BOVNED7	"Silver, Total	-0.07 u Jng/ka	0.07	1.0
		Arsenic, Total	2.2 NG/KG	0.22	1.0
		Barium, Total	130 У на/ка	0.02	· 1.0
		Beryllium, Total	0.24 MQ/KG	0.02	1.0
		Cadmium, Total	0.03 u mg/Rg	0.03	1.0
		Chromium, Total	5.5 Mg/KG	0.06	1.0
		Copper, Total	10.6 Mg/RG	0.04	1.0
		Mercury, Total	0.02 иСта/ка	0.92	1.0
		Wickel, Total	8.2 <u>⊬</u> Mg/Kg	0.08	1.0
		Lead, Total	э.o <u>Био/хо</u>	0.17	1.0
		Antimony, Total	0.17 ч5на/ка	0.17	1.0
	•	Selenium, Total	0.34 u MG/KG	0.34	1.0
		Thallium, Total	0.53 MG/RG	0.35	1.0
		Vanadium, Total	58.2 MG/KG	0.05	1.0
		Zinc, Total	39.0 У на/ка	0.04	1.0
-008	BOWNDS	Silver, Total	6.08 u Smg/Kg	0.08	1.0
		Arsenic, Total	2.8 MG/KG	0.27	1.0
		Barium, Total	70.3 ∑ ма/ха	0.02	1.0
		Beryllium, Total	0.28 MG/KG	0.03	1.0
		Cadmium, Total	0.04 u NG/KG	0.04	1.0
		Chromium, Total	7.5 Mg/Kg	0.07	1.0
		Copper, Total	10.4 MG/KG		1.0
		Mercury, Total	0.02 JR Mg/Kg	0.02	1.0
		Nickel, Total	8.2 Mg/Kg	0.10	1.0
		Lead, Total	3.4 J Mg/Kg	0.21	1.0
		Antimony, Total	0.21 u Jmg/Kg	0.21	1.0
		Selenium, Total	0.41 u MG/KG	0.41	1.0
		Thallium, Total	0.75 Mg/KG	0.44	1.0
		Vanadium, Total	67.3 NO/K		1.0
		Zinc, Total	44.5 J NG/K	0.05	1.0

2/11/00

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



Chemical and Environmental Measurement Information

Recra LabNet Philadelphia Analytical Report

Client: TNU-HANFORD B99-078

RFW#: 9910L501

SDG/SAF#: H0590/B99-078

W.O.#: 10985-001-001-9999-00

Date Received: 10-23-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 8 soil samples.

- 2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
- 3. All analyses were performed within the required holding times.
- 4. All cooler temperatures have been recorded on the Chain of Custody.
- 5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury) with the exception of the CCV following the last three samples for Cadmium (112.6%), Nickel (110.9%) and Lead (110.8%). All Cadmium results are non-detect so there is no significant bias to the results. The Nickel and Lead recoveries are just slightly outside the control limits so there should be no significant impact to the data.
- 6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
- 7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL) or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
- 8. All ICP Interference Check Standards were within control limits.
- 9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.
- 10. The matrix spike (MS) recoveries for 5 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 22-pages.

000016

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A serial dilution is performed for Mercury. A PDS was prepared at meaningful concentration levels, due to high concentrations of the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
BOWMD1	Antimony	500	104.4
	Lead	500 .	112.3
	Silver	500	102.2
	Zinc	500	106.2

- 12. The duplicate analyses for 7 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
- 13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

J. Michael Taylor

Vice President

Philadelphia Analytical Laboratory

mld/m10-501

11-22-99 Date



	Bechtel Hanford	Inc.	C	HAIN OF CUS	TODY/S	SAMPL	E ANAL	YSIS !	REQUEST	r	В9	9-078-144	Page 1	of]	
	Collector Bowers/Trice			nany Contact ris Cearlock	Telepho 372-		 _ -		Project Co ordi TRENT, SJ	nator	Price Code	8N	Data Turnaround		
	Project Designation 200 Area Source characterize	stion - 200-CW-1 QU		ling Location B pond					SAF No. 399-078		!	•	45	Days	
	ice Chesi No. ERC 99 0	12/009	9023 Fleid	Logbook No. -1511	•		·		Method of Shipment FED EX						
•	Shipped To DAN/RECRAD (3) 10-	71-12	Offsid	e Property Na	·				BM of Lading/	-	ia.				
		. — — — — — — — — — — — — — — — — — — —							COA BZ	20C	WIE	716			
	POSSIBLE SAMPLE HAZA	Ards/Remarks		Preservation	Nome	Coal 4C	None	Cool 40	Cool 4C	Coal 40	None				
				Type of Container	∌G	»G	aG.	»G	aG .	øG	"G		·	- 	
			.	No. of Container(s)	1	1	1	ī	1	1	1	1			
	Special Handling and/or Sto	rage	·	Volume	60mL	250mL	250mL	500ml,	500mL	1000m1	1000mL				
STODOO		SAMPLE AN	ALYSIS		fsotopic Uranium	VOA - 8260/ (TCL); VOA 8260A (Add On) (1- Propunol, Ethenol)	- 9015	San item (1) Special Instruction	B270A (TCL)	Son item (2) Special Instruction	Special				
DI.	Sample No. '	Matrix *	Sample Date	Sample Time						- A				1 3	
k	BOWMO)	Soil	10-21-1	9 1012		Х	Х	Х	X	χ	<u>i</u>	BowgT	9		
k	BOWMOL	501	10-01-9	7 1017		Y	V	У	У	Y		Bower	9		
k	BowMD3	501)	10-011	1071		<u>V</u>	, X		У	-	<u>.</u>	Bowgu	<u> </u>	<u> </u>	
K.	BOWM D4	5-1)	10-01-99)) 0)	75	<u> </u>	البلا	, , ,	X	<u> </u>		Bourse	<u>vo{_{1}}</u>		
~	BOWMD5	500	10-01-99	1118	KF		<u> </u>	X	<u> </u>			Bowy	Matrix	Saryster	
ľ	CHAIN OF POSSESSION		Sign/Pri	nt Names	0-2-11		CIAL INSTRU Chain of custody		on SAF B99-078.	,		}	Soil	•	
- 1	Relinquished By Down Down Down Rowers 10- Relinquished By	75 Date/Time - 21 - 99 / 14/00 Date/Time	Received By A p-f 3 (Received By	10-11-19)	te/Time 1400 ne/Time 02	Select Variation (2)	nium, Silver); IC adium, Zinc); Mi NO2/NO3 - 353.'	P Metals - ercury - 74 1: IC Anion	race) (Arsenic, Bo 6010A (Supertrac 71 - (CV); Chromi ns - 300.0 (Chloric	e Add-On) iom Hex - 1 de, Fluorid	: {Bery llium, C o /196 e, Nitrate , Nitri te	pper, Nickel,	Water Vapor Other Solid Other Liqui		
			30 Received By	Ex	le 27	(3) (Euro	Gamma Spectros pium-155); Gam I Uranium (Uran	copy (Cesi issa Soec -	onia - 350,3; Total ium-137, Cobalt-6 Add-on (Americi opic Plutonium; Is	0, Europius um-241}; S	n-152, Europius Stroutium-89,90	– Total Sr,		·	
	elinguished By	Diste/Time	Received By	\sim	#o/Time	Aune	ricium-241	•				j		•	
}	LABORATORY Received By	1/99 1800	Wieldthe	18:23-79	7800 Ti	ile						D	ste/Time		
	SECTION	* 1					Dispose	ed By		<u></u>		. D	ele/Time		
	FINAL SAMPLE Disposal Me DISPOSITION	::::::::::::::::::::::::::::::::::::::	·				<u>_</u>								

.

4

Bechtel Hanford	Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUE							В9	9-078-145	15 Page 1 of 1		
Collector Bowers/Trice			npany Contact hris Cearlock	Telepho 372-9				Project Coord TRENT, SJ	inster	Price Code	8N		rnaround	
Project Designation 200 Area Source characteriz	ation - 200-CW-1 OU	Sam 2	pling Location					SAF No. 45 Days B99-078						
ERC 96	·025		Field Logbook No. Me						Pment	- 1				
Shipped To TOWAVRECRA		Offs	ite Property No.	op s	<u> </u>			Bill of Lading/	Air Bill N	795	3 &	196	6	
									961		716			
POSSIBLE SAMPLE HAZA	ARDS/REMARKS	•	Preservation	None	None	None	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C	None	
· ·			Type of Container	₽G ·	#G	øG	₃G) aG	øG	aG	aG .	₽G	øG	
		•	No. of Container(s)	1	1	1		'	,	. 1		, -,	,	
Special Handling and/or Stor	rage		Volume	60mL	60mL	60mL	120ml	. 250mL	250m1.	500mL	500mL	1000mL	1000mL	
00001:	SAMPLE ANA	ALYSIS		Stotopic Uranium	Midel-63	Tackgathun 99	Trition -]	13 VOA - \$260A (TCL); VOA - \$260A (Add- On) [1- Properol, Ethenol]	pH (Soil) - 9045	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL); TPff-Diesel Range - WTPH-D; PCBs - 8062	See item (2) je Speciel Instructions.	See item (1) in Special Instructions.	
Sample No.	. Matrix *	Sample Date	Sample Time				192 3 4		No. Wallet				न्यूंचे े	
How M Db	Spil	10-21-	99 1130	·				X	χί	Y	Υ	Χ		
no mmn7	5=,1)	10-11	98 1140					Х	_ <u>Y</u>	χ	X	Х		
Bo mm D8	5.,1)	10-21-	97 1150					I V	X	, X	Ŋ.	_X		
								 					· · · · · · · · · · · · · · · · · · ·	
CHAIN OF POSSESSION		Sign/Pri	at Names		SPECI See ch	AL INSTRU	CTIONS	SAF B99-078.				Matrix ' Soil Water	• ———	
Relinquisted By Ret 3C 10:24.4	>)-99/1400 Day/Time 99/0800	Received By	C 10-21-99/	e/Time /400 e/fig. 94	Selenin Vanadi (2) NO Sulfate (3) Ga	m, Silver); IC ium, Zinc); Me)2/NO3 - 353. l); Sulfides - 90 ruma Spectrosc	P Metals - scury - 747 I; IC Anion 30; Ammo sopy (Cesic	race) (Arsenic, Be 6010A (Supertrace 11 - (CV); Chromiu 5 - 300.0 (Chlorid nia - 350.3; Total am-137, Cobalt-60	: Add-On) nn Hex - 71 le, Fluoride, Cyanide - 9 l, Europium	(Beryllium, Cop 196 Nitrate, Nitrite, 010 -152, Europium-	Phosphate,	Vapor Other Solid Other Liquid		
Relinquished By KIKKI Thom Relinquished By	R Transport 1430 FCOEK Duffer American-24									rontium-89,90 ium (Thorium-23				
Z 1 1 429	2799 1000	lidd He	- G 1023. FA	1000 Title	45	. Dow	861	os TA.	54	# = ~!	De	nte/Time		
SECTION FINAL SAMPLE Disposal Mot	fied					Dispose	d By		ווטר		De	ite/Time		
DISPOSITION						,								

Toward Transfil	R TRC		HAIN UF CUS	TUDYA	SAMPLI	E ANAL	Lysis F	REQUES	T	B9	9-078-144	Page 1	of <u>1</u>
Collector Bowers/Trice			pany Contact ris Cearlock	Telepho 372-9				roject Coordi RENT, SJ	astor	Price Code	8N	Data Te	urnaround
Project Designation 200 Area Source characterize	zation - 200-CW-1 OU	Samy	ling Location Boond					AF No. 99-078				45	Days
ice Chest No.	A 2 5	Field	Logbeok No.	 -			M	fethod of Ship FED EX	ent				
Shipped To	<u> </u>		e Property No.	 -				in of Lading/	Air Bill N	o.			
TMAREPRA \$ 18 10	11-99		7 000	00	<u>55</u>			42:	<u>35</u>	795	3	034	lola
<u> </u>				·- •	•		10	COA B	200	اس'	67	د في ا	
POSSIBLE SAMPLE HAZ	ARDS/REMARKS		Preservation	None	Cool 4C	None	Cool 4C	Cool 4C	Cool 4C				1
·			Type of Container	#G	ıG	#G	aG	»G	•G	#G	 		1
		_	No. of Container(s)		1	1.	1 7.		1	 	 		
Special Handling and/or Sto	orage		Volume	60mL	250mL	250mL	500mL	500mL	1000mi.	1000mL		}	1
000020	SAMPLE ANA	LYSIS	· ·	Instepic Urunium j	VOA - 8260A (TCL); VOA - 8260A (Add- On) [1- Propenci, Ethesel]	pH (Soif) - 9045	See item (1) is Special Instructions	Semi-VOA - \$270A (TCL); TPH-Dissel Range - WTPH-D; PCBs - 8082	See item (2) Special Instruction	in See item (1) in Special instructions.			
Sample No.	Matrix *	Sample Date	Sample Time		La Zii		119 70 0		,				
Bown D)	Asoil	10.21-9	9 1919	X		-				X	Boy	, 2T9_	10.00
BOWADA .	85011	1000	9 1017	یلا						Ιχ̈́		كصيدي	110
BOWMD3 &	501	10-21-1	1 1047	χ,						20.90	Dow	200	
BOWN04	501)	10-21.9	1 1102	У					· BY	X	Bou	900	<u> </u>
Bownny	50,1	10-21.7	7 1119		· .		-	<u>li</u>			Bowl		<u> </u>
CHAIN OF POSSESSION		Sign/Prin	t Names	•		AL INSTRI		saf B99-078,	ļ			Matrix Soil	•
Delinovish 4 Rv	10-21-97/14	Received B/12	3C 10-21-91	of Time	Seleniu Vanadi	zm, Silver); IC ium, Zinc); Mi 02/NO3 - 353.	IP Metals - 60 fercury - 7471 1: IC <i>Anions</i>	ice) (Arsenic, Ba 010A (Supertraci - (CV); Chromi - 300.0 (Chlorid in - 350.3; Total	s Add-On) um Hex - 7 le, Fluoride	Beryllium, Cop 196 Nitrate, Mitrite,	per, Nickel,	Water Vapor Other Solid Other Liquid	•
Relinquisted ByD, KKIThe	02 99 1080 VEN Part Time 4 130 99 1143	Received By	EX Coly Cxon	e/Time	Europii Total L	umme Spectros um-155); Gam	copy (Cesiun ma Spec - A	m-137, Cobalt-60 dd-on (Americiu ic Plutonium; Iso	, Europium m-241}; St	-152, Europium- rontium-89,90 —	Total Sr;		
Feder 1	0001 PPERO	Vufite	10:2377	1000					· į		Da	te/Time	-
LABORATORY Received By SECTION			· 3			Dispose	-I D-	·	:		, Det	le/Time	

Appendix 5

Data Validation Supporting Documentation

WHC-SD-EN-SPP-002, Rev. 2

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	В	C	D	Ε
PROJECT:	200-CW-	4	DATA PACKAGE		90
VALIDATOR:	TU	LAB: Reco	A	DATE: //3	1/00
CASE:			SDG: 14	0390	
		ANALYSES	PERFORMED	· · · · · · · · · · · · · · · · · · ·	_
CLP/ICP	CLP/GFAA	CLP/Hg	☐ CLP/Cyanide	0	0
SW-846/ICP	☐ SW-846/GFAA	#SW-846/Hg	SW-846 Cyanida	`o	0
SAMPLES/MATR	Bour	4D/ Ba	NWD (BOWMD3 1	Bonnda
		-			Sarl
1. DATA PACK Is technical Is a case nar Comments:	rative presen	documentation	present? .	releus	Yes No WA
2. HOLDING T Are sample ho Comments:	lding times a	<u>-</u>			Ŷes No N/A
			<u> </u>		

WHC-SD-EN-SPP-002, Rev. 2

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS						
Were initial calibrations performed on all instruments? Yes	No	N/A				
Are initial calibrations acceptable? Yes	No	N/A				
Are ICP interference checks acceptable? Yes	No	N/A				
Were ICV and CCV checks performed on all instruments? Yes						
Are ICV and CCV checks acceptable? Yes						
Comments:		N/A				
4. BLANKS						
Were ICB and CCB checks performed for all applicable analyses? Yes	No	N/A				
Are ICB and CCB results acceptable?	, No	(N/A)				
Were preparation blanks analyzed?	No	N/A				
Are preparation blank results acceptable? Yes	No	N/A				
Were field/trip blanks analyzed? Yes	No	N/A				
Are field/trip blank results acceptable? Yes	No	N/A				
Comments:	· .					
5. ACCURACY						
Were spike samples analyzed?	No	N/A				
Are spike sample recoveries acceptable? Yes	No	, MA				
Were laboratory control samples (LCS) analyzed? Yes	No	N/A				
Are LCS recoveries acceptable? Yes	No	W/A				
Comments: 5.14 3492 Hz - 120 level 4.7 Ant	7	38 <u>5.</u>				
Zine 34 Rundelile Hz						
		_				

WHC-SD-EN-SPP-002, Rev. 2

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION
Were laboratory duplicates analyzed?
Are laboratory duplicate samples RPD values acceptable? Yes NA
Were ICP serial dilution samples analyzed? Yes No N
Are ICP serial dilution %D values acceptable? Yes No
Are field duplicate RPD values acceptable? Yes No N/A
Are field split RPD values acceptable? Yes No WA
Comments: Qual 43.4 FD Bar 3170 (457 Hy 5
Silver 35%
Barin 30, 2
Cadmin S9.7 WINZX RDL
7. FURNACE AA QUALITY CONTROL
Were duplicate injections performed as required? Yes No N/A
Are analytical spike recoveries acceptable? Yes No N/A
Was MSA performed as required? Yes No N/A
Are MSA results acceptable? Yes No N/A
Comments:
8. REPORTED RESULTS AND DETECTION LIMITS
Are results reported for all requested analyses?
Are all results supported in the raw data? Yes No MT
Are results calculated properly? Yes No
Do results meet the CRDLs?
Comments:
·

INORGANICS PRECISION REPORT 11/18/99

CLIENT: THU-HANFORD B99-078

RECRA LOT #: 9910L501

WORK ORDER: 10985-001-001-9999-00

			Initial			DILUTION
SAMPLE	SITE ID	analyte	RESULT	REPLICATE	RPD	factor (REP)
	************		******	*******	******	*********
-001REP	BOMIDI	Silver, Total	1.4	5.9	35.0	1.0
		Arsenic, Total	3.2	2.5	24.6	1.0
		Barium, Total	100	79.4	30.2	1.0
		Beryllium, Total	0.31	0.30	2:7	1.0
		Cadmium, Total	0.47	0.26	59.7	1.0
		Chromium, Total	11.9	13.4	11.9	1.0
		Copper, Total	18.5	15.5	17.6	1.0
	•	Mercury, Total	0.98	1.0	4.6	1.0
		Nickel, Total	9.3	10.5	12.1	1.0
		Lead, Total	139	89.3	43.4	1.0
		Antimony, Total	0.72	0.22u	200 -سيعد	1.0
		Selenium, Total	0.43u	0.43u	IRC	1.0
		Thallium, Total	0.454	0.45%	19C	1.0
		Vanadium, Total,	52.0	55.6	6.7	1.0
		Zinc, Total	127	98.6	25.4 Correcti	ins 1.0
			•		19 1	1/18/41

INORGANICS ACCURACY REPORT 11/18/99

CLIENT: THU-HANFORD 899-078 WORK ORDER: 10985-001-001-9999-00 RECRA LOT #: 99101501

			PAIKED	INITIAL	SATKED		DILUTION
SAMPLE	SITE ID	ANALYTE	Sample	RESULT	ANOUNT	*RECOV	factor (SPK)
******	*************	************	*****	******	*****	*****	********
-001	BOWND1	Silver, Total	10.2	77 0.4	5.3	34.0	1.0
		Arsenic, Total	200	3.2	211	93.7	1.0
		Barium, Total	280	108	211	\$1.0	1.0
		Beryllium, Total	4.9	0.31	5.3	86.6	1.0
		Cadmium, Total	5.1	0.47	5.3	87.3	1.0
		Chromium, Total	32.0	11.9	21.1	95.3	1.0
		Copper, Total	41.2	18.5	26.3	86.3	1.0
		Mercury, Total	0.76	0.98	0.18	-120. *	1.0
		Nickel, Total	59.8	9,3	52.7	95.8	1.0
		Lead, Total	141	139	52.7	4.7	1.0
		Antimony, Total	21.0	0.72	52.7	38.5	1.0
		Selenium, Total	194	0.43u	211	92.3	1.0
		Thallium, Total	109	0.45u	211	89.9	1.0
		Vensdium, Total	109	52.0	52.7	108.5	1.0
		Zine. Total	148	177	E2 7	34.0	1.0

INORGANICS ACCURACY REPORT 11/18/99

CLIENT: THU-HANFORD B99-078

RECRA LOT \$1 59101501

WORK ORDER: 10985-001-001-9999-00

			SPIKED	INITIAL	SPIK ED		DILUTION
SAMPLE	SITE ID	ANALYTE	SAMPLE	RESULT	AMOUNT	TRECOV	factor (SPK)
******	**************	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	*****	******	*****	******	
-001	BOMD1	Silver, Total	10.2	8.4	5.3	34.0	1.0
		Arsonic, Total	200	3.2	211	93.7	1.0
		Berium, Total	280	108	211	81.6	1.0
		Seryllium, Total	4.9	0.31	5,3	46.6	1.0
		Cadmium, Total	5.1	0.47	5.3	87.3	1.0
		Chromium, Total	32.0	11.9	21.1	95.3	1.0
		Copper, Total	41.2	10.5	26,3	96.3	1.0
		Mercury, Total	0.76	0.98	0.10	-120. +	1.0
		Nickel, Total	59.8	9,3	52.7	95.8	1.0
		Lead, Total	141	139	52.7	4.7	1.0
		Antimony, Total	21.0	0.72	52.7	38.5	1.0
		Selenium, Total	274	0.434	211	92.3	1.0
		Thallium, Total	189	0.45u	211	89.9	1.0
		Vanadium, Total	109	52.0	52.7	108.5	1.0
		Zing. Total	148	122	E9 7	34.0	1.0

INORGANICS PRECISION REPORT 11/18/99

CLIENT: THU-HANFORD B99-076

RECRA LOT #: 9910L501

WORK CRDER: 10985-001-001-9999-00

	,		INITIAL			DILUTION
Sanple	SITE ID	ANALYTE	RESULT	REPLICATE	RPD	factor (REP)
******	***************************************	***************	*******			********
-001REP	BOMICO1	Silver, Total	8.4	5.9	35.0	1.0
		Arsenic, Total	3.2	2.5	24.6	1.0
		Barium, Total	100	79.4	30.2	1.0
		Beryllium, Total	0.31	0.30	2 .7	1.0
		Cadmium, Total	0.47	0.26	59.7	1.0
		Chromium, Total	11.9	13.4	11.9	1.0
		Copper, Total	10.5	15.5	17.6	1.0
		Mercury, Total	0.98	1.0	4,6	1.0
		Nickel, Total	9.3	10.5	12.1	1.0
		Lead, Total	139	69.3	43.4	1.0
		Antimony, Total	0.72	0.22u	200 جسعود	1.0
		Selenium, Total	0.43u	0.434	MC .	1.0
		Thallium, Total	0.45u	0.45u	MC.	1.0
		Venedium, Total.	52.0	55.6	6.7	1.0
		Zinc, Total	127	>8.6	correcti Ng 11	(ns 2.0 (ns 2.0

Date:

15 February 2000

To:

Bechtel Hanford Inc. (technical representative)

From:

TechLaw, Inc.

Project: 200 Area Source Characterization - 200-CW-1 Operable Unit Subject: Volatiles - Data Package No. H0590-RLN (SDG No. H0590)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0590-RLN prepared by Recra LabNet (RLN). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B0WMD1	10/21/99	Soil	С	See note 1 & 2
BOWMD2	10/21/99	Soil	С	See note 1 & 2
BOWMD3	10/21/99	Soil	С	See note 1 & 2
BOWMD4	10/21/99	Soil	С	See note 1 & 2
BOWMD5	10/21/99	Soil	С	See note 1 & 2
BOWMD6	10/21/99	Soil	С	See note 1 & 2
BOWMD7	10/21/99	Soil	С	See note 1 & 2
BOWMD8	10/21/99	Soil .	С	See note 1 & 2

^{1 -} Volatiles by EPA 8260A

Data validation was conducted in accordance with the BHI validation statement of work and the 200-CW-1 Operable Unit RI/FS Work Plan and 216-B-3 RCRA TSD Unit Sampling Plan, DOE/RL-99-07, Draft B. Appendices 1 through 5 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation

^{2 -} Alcohols (butanol and ethanol) by 8015B and diesel range organics by 8015B

DATA QUALITY OBJECTIVES

Holding Times

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. Preserved soil samples must be analyzed within 14 days of the date of sample collection for VOA, diesel and alcohols. If holding times are exceeded, but not by greater than twice the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than twice the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

Blanks

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples of a given matrix. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for laboratory contaminants) the highest associated blank result, the sample result value is raised to the CRQL, qualified as undetected and flagged "U".

Due to laboratory blank contamination, the methylene chloride result in all samples were qualified as undetected and flagged "U".

All other method blank results were acceptable.

Accuracy

Matrix Spike/Matrix Spike Duplicate Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using the target compounds for which

percent recoveries must be within control limits of 70-130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix spike/matrix spike duplicate recovery results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of system performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Samples with surrogate recoveries less than ten percent are qualified as estimates and flagged "J" for detects, and rejected and flagged "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification. Surrogates are not required for formaldehyde analysis.

Due to the lack of a surrogate analysis, all n-propyl alcohol and ethanol results were qualified as estimates and flagged "J".

Due to the surrogate being diluted out of the sample, the diesel range organic result in sample BOWMD4 was rejected and flagged "R" and the motor oil result was qualified as an estimate and flagged "J".

All other surrogate recovery results were acceptable.

Precision

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. For samples analyzed using SW-846 protocol, results must be within RPD limits of \pm 1-30% for solid samples. If RPD values are out of specification and the sample concentration is less than five times the spike

concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples BOWMD1/BOWMD2) were submitted to RLN for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. The RPD for motor oil (50%) was outside QC limits. Under the BHI statement of work, no qualification is required. All other field duplicate results were acceptable.

Analytical Detection Levels

Reported analytical detection levels are compared against the PQL to ensure that laboratory detection levels meet the required criteria. The following were reported above the PQL: Chloromethane, bromomethane, vinyl chloride, chloroethane, acetone, 2-butanone, 4-methyl-2-pentanone and 2-hexanone in samples BOWMD2, BOWMD3, BOWMD5, BOWMD6 and BOWMD7; and all analytes(with a PQL) in samples BOWMD1, BOWMD4 and BOWMD8. Under the BHI statement of work, no qualification is required. All other analytes met the analyte specific CRDL.

Completeness

Data package No. H0590-RLN (SDG No. H0590) was submitted for validation and verified for completeness. The completion percentage was 99.6%.

MAJOR DEFICIENCIES

Due to the surrogate being diluted out of the sample, the diesel range organic result in sample BOWMD4 was rejected and flagged "R". Rejected data is unusable and should not be reported.

MINOR DEFICIENCIES

Due to the lack of a surrogate analysis, all n-propyl alcohol and ethanol results were qualified as estimates and flagged "J". Due to the surrogate being diluted

out of the sample, the motor oil result was qualified as an estimate and flagged "J". Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Due to laboratory blank contamination, the methylene chloride result in all samples were qualified as undetected and flagged "U".

The following were reported above the PQL: Chloromethane, bromomethane, vinyl chloride, chloroethane, acetone, 2-butanone, 4-methyl-2-pentanone and 2-hexanone in samples BOWMD2, BOWMD3, BOWMD5, BOWMD6 and BOWMD7; and all analytes(with a PQL) in samples BOWMD1, BOWMD4 and BOWMD8. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, Validation Statement of Work, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-99-07, Draft B, 200-CW-1 Operable Unit RI/FS Work Plan and 216-B-3 RCRA TSD Unit Sampling Plan.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validator in compliance with the BHI validation SOW are as follows:

- U Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for dilution and moisture content by the laboratory.
- UJ Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J Indicates the compound or analyte was analyzed for and detected. The
 associated concentration is an estimate, but the data are usable for
 decision-making purposes.
- R Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.
- NJ Indicates presumptive evidence of a compound at an estimated value.

 The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0590	REVIEWER: TLI	DATE: 2/15/00	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene chloride	U	All ,	Blank contamination
Diesel range organics	R	BOWMD4	Surrogate diluted out
Motor oil	J	BOWMD4	Surrogate diluted out
n-Propyl alcohol, ethanol	J	All .	No surrogate analysis

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD Laboratory: RECRA LabNet SDG: H0590 Case: BOWMD1 BOWMD2 BOWMD3 BOWMD4 BOWMD5 BOWMDA BOWMD7 BOWMD8 Sample Number B Pond B Pond B Pond B Pond B Pond B Pond Location B Pond B Pond Remarks Duplicate 10/21/99 Sample Date 10/21/99 10/21/99 10/21/99 10/21/99 10/21/99 10/21/99 10/21/99 Analysis Date 11/01/99 11/01/99 11/01/99 11/01/99 11/01/99 11/01/99 11/01/99 11/01/99 VOA CROL Result ĺα Result lα Result a Result Result lα Result la Result Result lα 10 U 10 lu 9 U Chloromethane 5 12 U 12 U 10 9 U 11 lu 12 U 10 U 10 U 9 U 5 12 U 10 U 9 U 11 U Bromomethane 5 12 U 10 U 10 U 9 U 10 U 9 U 11 U Vinyl Chloride 12 U 5 9 U 10 U Chloroethane 12 ไป 10 10 lu 12 9 U 11 lu 7 U Methylene Chloride 5 9lu 6 U 18 U 5 U 5 U 8 U 10 U 9 U 10 12 U 10 U 12 U 10 9 10 11 lu Acetone 4 U 6 U 6 បែ 5 JU 5 U 6 U 5 U 5 ไป Carbon Disulfide 6 U 5 lu 5 U 6 U 5 U 5 U 4 U 6 U 1.1-Dichloroethene 5 5 5 IU 6 lu 6 JU 5 lu 5 ÎU 6 U 5 U 4 IU 1.1-Dichloroethana 5 U 5 U 6 U 5 lu 4 11 5 6 IU 5 U 6 lu 1.2-Dichloroethene (total) 5 U ខ ប្រ 5 U ร โบ 4 6 JU 5 6 JU 5 JU Chloroform 5 U 5 (U 5 U 5 U 4 U 6 lu 5 6 U 6 JV 1,2-Dichloroethane 12 U 9 U 10 U 9 0 11 lu 10 12 U 10 U 10 U 2-Butanone 5 U 6 U 6 JU 5 U 6 U 5 lu 4 U 5 5 W 1,1,1-Trichloroethana 6 U 5 U 6 U 6 JU 5 lu 5 U 5 U 4 lu 5 Carbon Tetrachloride 5 U 5 lu 6 U 5 U 4 U 5 6 U 5 U 6 U Bromodichloromethane 6 \U 5 W 5 10 6 U 5 U 5 U 4 U 5 6 U 1,2-Dichloropropane 5 U 6 U 5 U 5 U 4 U 6 lu 5 U 5 6 U cis-1,3-Dichloropropene 5 U 6 lu 6 U 5 U 4 U 5 5 U 5 IU 6 U Trichloroethene вlu 5 U 5 U 6 U 5 U 5 U 4 U 5 6 JU Dibromochloromethane 5 U 5 U 6 lu 5 вlu 5 U 5 6 U 4 IU 1.1.2-Trichloroethane 6 Ju 5 U 5 U 4 U 5 6 JU 5 U 5 6 U Benzene 6 U 5 U 6 U 5 5 U 4 lu 6 ใบ 5 lυ 5 trans-1,3-Dichloropropene 5 U 5 6 U 5 U 5 6 U 5 lu 4 lu 6 U Bromoform 10 lu e lu 11 U 10 U 10 U 12 U 9 10 5 12 U 4-Methyl-2-pentanone 10 12 U 9 | U 10 U e lu 11 U 5 12 U 10 2-Hexanone 6 U 5 U 2 4 lu 5 U 5 6 U 5 6 lu Tetrachloroethene 6 U 5 U 5 U 4 U 6 U 5 lu 5 lU 5 6 lu 1,1,2,2-Tetrachloroethane 6 U 6 JU 5 lu 5 U 5 U 5 U 4 IU 5 6 JU Toluene 6 U 6 lu 5 U 5 U 5 U 4 lu 5 U 5 e lu Chlorobenzene 6 U 5 U 5 U 4 U 5 U 5 U 6 U 5 6 IU Ethvibenzene 6 U 5 U 6 U 5 U 5 U 4 |U 5 U 5 6 U Styrene 5 U 6 U 5 U 6 U 5 U 5 6 U 5 U Xylenes (total)

_	
9	;
\subseteq	
\subseteq	
-	
Ŋ	

Project: BECHTEL-HANFORD				1														
Laboratory: RECRA LabNet				}														
Case:	SDG: HO	590		ļ									·				·····	
Sample Number		BOWMD1		BOWMD2		BOWMD	BOWMD3		BOWMD4		BOWMD5		BOWMD6		BOWMD7		BOWMD8	
Location		B Pond		B Pond		B Pond			B Pond		B Pond		B Pond		B Pond		B Pond	
Remarks				Duplicate							<u> </u>		<u> </u>		<u> </u>		<u> </u>	
Sample Date		10/21/99		10/21/99		10/21/9	9		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99	
Preparation Date		11/03/99		11/03/99		11/03/9	9		11/03/99		11/03/99		11/03/99		11/03/99		11/03/99	
Analysis Date		11/04/99		11/04/99		11/04/9	9		11/04/99		11/04/99		11/04/99		11/04/99		11/04/99	
Alcohols	CRQL	Result	a	Result	Q	Result		Q.	Result	a	Result	a	Result	Q.	Result	Q_	Result	<u>a</u> _
n-Propyl alcohol		5.0	บม	5.0	UJ		5.5	บง	5.0	ນນ	5.0	UJ	5.0	խյ	5.0	บบา	-	րո
Ethanol		5.0	UJ	5.0	UJ		5.5	UJ	5.0	υJ	5.0	ա	5.0	խ	5.0	րա	5.0	w
		<u> </u>	L	<u> </u>	<u></u>					<u> </u>		<u> </u>	<u> </u>	↓	 	ــــ	 	┞
			<u> </u>	<u> </u>	<u> </u>		i		<u> </u>			<u> </u>	<u> </u>	<u> </u>		1_	} ——	1
Preparation Date		10/28/99		10/28/99		10/28/9	9		10/28/99		10/28/99		10/28/99		10/28/99		10/28/99	
Analysis Date		11/12/99		11/12/99		11/12/9	9	_	11/12/99		11/12/99		11/12/99		11/12/99		11/12/99	т—
Diesal Range Organics	5	6.5	I	4.3	U	<u> </u>	4.4	<u>u_</u>	45	UR	4.2	<u>u</u>		ıΙυ		<u>≀ ∪</u>	4.2	-
Motor Oil		78		130	l	<u> </u>	47	<u>U_</u>	1100	J	39	<u> </u>	47	<u>' U</u>	45	<u> </u>	45	U_
											<u> </u>	١_		↓	 	 	ļ	↓ —
											<u> </u>	<u> </u>	1	↓		 	↓	₩-
										<u> </u>	<u> </u>	ــــــ		↓	 	ــ		↓
					L	I				L		 		↓		╄-	├	
	1		T		I^-				<u> </u>	1	<u> </u>	<u> </u>	<u> </u>	Щ.				

*= Outside of EPA CLP QC limits.

					<u> </u>	<u> </u>	V-SURI TVE	<u> </u>		•	<u>. xe</u>	
Cust ID:	BOMMD	1	BOWMD	1	BOWMD:	1	BOWMD:	2	BOWND:	3	BOWMD	4
Sample = RFW#:	00	1	001 M	S	001 MS	D	00:	2	00:	a	. 00	4
Information Matrix:	SOIL	_	SOIL		SOIL	-	SOIL	-	SOIL	_	SOIL	-
D.F.:	1.		1.		0.94		0.90	19	0.9			04
Units:	- •		UG/		UG/1		UG/1		UG/I		UG/	
	,		40,		30,		00,	•••	00,		00,	
Toluene-d8	99	ł	106	f	103	ł	105	*	103	¥	112	*
Surrogate Bromofluorobenzene	94	ક	102	*	100	ક	94	*	91	¥	78	š
Recovery 1,2-Dichloroethane-d4	105	ક	112	¥	111	¥	108	ŧ	112	¥	115	ક
2======================================		-=fl:	*******	-=fl	*========	==f1		=fl=	.========	-=fl	=*=*====	==f1
Chloromethane	_ 12	U	11	U	10	U	10	Ü	10	U	12	U
Bromomethane	_ 12	U	11	U	10	U	10	U	10	U	12	U
Vinyl Chloride	12	U	11	Ü	10	U	10	U	10	U	12	U
Chloroethane	_ 12	IJ	11	U	10	U	10	U	10	U	12	
Chloroethane Methylene Chloride	_ 9	BU	9	В	8	В	7	ŔÜ	6	\$ () 18	BO
Acetone	12	U	11	U	10	U	10	U	10	U	12	U
Carbon Disulfide	_ 6	U	6	U	5	U	5	U	5	U	6	U
1,1-Dichloroethene	_ 6	U	92	Ł	93	ł	5	U	5	U	6	U
1,1-Dichloroethane	_ 6	Ū	6	U	5	U	5	Ü	5	U	6	U
1,2-Dichloroethene (total)	_ 6	U	6	U	5	Ü	5	U	5	U	6	IJ
Chloroform	_ 6	U.	6	U	5	Ū	5	U	5	U	6	U
1,2-Dichloroethane	_ 6	U	6	U	5	Ū	5	U	5	U	6	U
2-Butanone	12	U	11	U	10	U.	10	Ü	10	U	12	Ū
1,1,1-Trichloroethane	. 6	Ü	6	U	5	U	5	U	5	U	6	U
Carbon Tetrachloride	. 6	U	6	U	. 5	Ū	5	U	5	U	6	U
Bromodichloromethane	6	บ	6	U	5	Ū	5	U	<i>.</i> ∽ 5	U	6	U
1,2-Dichloropropane		Ü	6	U	5	U	5 /.	U	´ 5	U	6	ប
cis-1,3-Dichloropropene	6	U	6	U	5	Ū	5	υį	5	U	6	ប
Trichloroethene	. 6	U	100	*	98	ક	5	ប	5	U	6	U
Dibromochloromethane	6	U	6	U	5	ប	5	U	5	Ū	6	ប
1,1,2-Trichloroethane	6	U	6	U	5	Ū	5	U	5	U	6	U
Benzene	6	U	107	¥	105	¥	5	U	5	U	6	υ
Trans-1,3-Dichloropropene	6	U	6	U	5	Ü	5	U	5	U	6	บ
Bromoform	6	U	6	U	5	Ū	5	U	5	U	6	U
4-Methyl-2-pentanone	12	U	11	U	10	U	10	U	10	U	12	ប
2-Hexanone	12	U	11	U	10	Ū	10	U	10	U	12	U
Tetrachloroethene	· 6	บ	6	U	5	U	5	U	5	U	6	ប
1,1,2,2-Tetrachloroethane	6	บ	6	U	5	U	5	U	5	U	6	บ
Toluene	6	U	108	¥	106	ł	5	U	5	Ü	6	U

J. 13-68-44

RFW Batch Number: 99	Cust ID:	ent: TNU- BOWMD1	•	RD B99-01 BOWMD		Work (: 109850010 BOWMD2		1b WMD3		BOWMD4	, K
	RFW#:	001		001 MS		001 MSD)	002		003		004	ļ
Chlorobenzene		6	U	109	*	106	*	5 (J	5	U	. 6	U
Ethylbenzene		6	U	6	U	5	U	5 (ט	5	U	6	U
Styrene		6	U	6	U	5	U	5 1	ני	5	U	6	U
Xylene (total)		6	U	6	U	5	U	5 1	J	5	U	6	Ü
*= Outside of EPA CL	P QC limits.												

12/11/00

Volatiles by GC/MS, HSL List

Report Date: 12/08/99 12:08 (2)

RFW Batch Number: 9910L501 Client: TNU-HANFORD B99-078 Work Order: 10985001001 Page: 2a

	3° 6	Cust ID:	BOWND	4	BOWMD	5	BOWMD	6	BOWMD	7	BOWMD	В	VBLKAI	
Sa	mple =	RFW#:	00	4	00:	5	000	6	00	7	001	R	99LVH505-1	MB1
In	formation	Matrix:	SOIL		SOIL		SOIL	•	SOIL	-	SOIL	_	SOIL	
	\mathcal{S}	D.F.:	1.	02	0.8		0.9		0.8		1.0		1.0	
	_	Units:	UG/		UG/I		UG/I		UG/		UG/I		UG/I	
	<u></u>		REP		J.,		00,				007.		007	
	7	Coluene-d8	120		102	ł	97	ł	98	ł	97	&	96	8
Su.	rrogate Bromofluc	robenzene	106	*	92	¥	92	¥	92	*	96	¥	95	8
Re	covery 1,2-Dichloro	ethane-d4	132	* %	102	*	101	¥	95	*	105	8	103	è
==		*******		fl	=========	fl-		==fl=	****	==fl==	=======	=f1:		==f1
Ch.	loromethane		11	U	9	U	10	U	9	U	11	U	10	Ü
	omomethane		11	U	9	U	10	U	9	U	11	U	10	U
Vi	nyl Chloride		11	U	9	U	_ 10	ប	9	U	11	U	10	ប
Ch.	loroethane		11	U	9	U	10	U	9	U	11	U	10	U
Met	thylene Chloride		10	В	5	BU	7	∌ U	5	æυ	8	BU	4	J
Ace	etone		11	U	9	U	10	ับ	9	U	11	U	10	U
Car	rbon Disulfide		6	Ü	. 5	Ú	5	U	4	U	6	U	5	U
1,1	l-Dichloroethene		6	U	5	U	5	U	4	U	6	U	5	U
1,1	l-Dichloroethane		6	U	5	U	5	ប	4	U	6	U	5	U
1,2	2-Dichloroethene (tota	1)	6	U	. 5	Ū	5	Ū	4	Ü	6	U	5	Ū
Ch]	loroform		6	U	5	U	5	U	4	ប	6	U	5	U
(1,2	2-Dichloroethane		6	U	5	U	5	U.	4	U	6	Ü	5	U
	Butanone		11	U	9	U	10	U	9	U	11	Ū	10	Ü
1,1	l,1-Trichloroethane		6.	U	5	U	5	U	4	U	6	U	5	U
Car	rbon Tetrachloride		6	U	5	U	5	U	4	U	- 6	U	5	U
Bro	omodichloromethane	<u>.</u>	6	U	5	U	5	U	4	ω,	· 6	U	5	Ū
			6	Ü	5	U	5	บ	4	ប	6	U	5	U
cis	s-1,3-Dichloropropene_		· 6	U	5	Ū	5	U	4	U	6	U	5	U
Tri	chloroethene		6	U	5	U	5	U	4	Ū	6	Ü	5	U
Dib	romochloromethane		6	Ü	5	U	5	υ	4	U	6	U	5	U
1,1	,2-Trichloroethane		6	U	5	U	5	U	4	U	6	U	5	U
	izene		6	U	5	U	5	U	4	U	6	U	5	Ü
Tra	ns-1,3-Dichloropropen	e	6	U	5	U	5	U	4	U	6	U	5	U
Bro	omoform		6	Ü	5	U	5	U	4	U	6	U	5	U
4 -M	fethyl-2-pentanone		11	U	9	U	10	U	9	U	11	U	10	U
2-H	lexanone		6	J	9	บ	10	U	9	U	11	U	2	J
Tet	rachloroethene	****	6	Ū	5	U	2	J	4	U	6	U	5	U
1,1	,2,2-Tetrachloroethan	e	6	U	5	U	5	U	4	U	6	U	5	Ū
Tol	uene		6	Ü	5	U	5	U	4	U	6	U	, 5	U
	A	3												

*= Outside of BPA CLP QC limits.

MITHER

RFW Batch Number: 9910	L501 Clic Cust ID:	ent: TNU-I BOWMD4	ianfo	RD_B99-07 BOWMD5		Work C		<u>: 10985001</u> В омм р 7	001_	Page: 2b BOWMD8		VBLKAI	•
	RFW#:	004 REPRI	5P	005		006		007		008		99LVH505-1	@ 1
Chlorobenzene			U	5	U	5	Ų	4	U	6	U	5	U
Ethylbenzene		6	U	5	U	5	U	4	U	6	U	5	U
Styrene		6	U	5	U	5	U	4	U	6	IJ	5	U
<pre>Xylene (total) *= Outside of EPA CLP</pre>	OC limits.	1	J	, 5	U	5	U	4	U	6	U	5	U

Volatiles by GC/MS, HSL List

Report Date: 12/08/99 12:08

RFW Batch Number: 9910L501 Client: TNU-HANFORD B99-078 Work Order: 10985001001 Page: 3a

Sample Information

Cust ID: VBLKAI BS **VBLKWX**

RFW#: 99LVH505-MB1 99LVH507-MB1 Matrix: SOIL SOIL

THIOT MACTON		2011		2017		
Č	D.F.:	1.0		1.		
•	Units:	UG/I	KG	UG/	KG	
Тс	luene-d8	98	*	94		· · · · · · · · · · · · · · · · · · ·
Surrogate Bromofluor	obenzene	96	ક	94	ł	
Recovery 1,2-Dichloroe	thane-d4	99	¥	96	ł	
		****	fl		-=fl	=======fl======fl======fl======fl======fl======
Chloromethane		10	U	10	U	
Bromomethane	·	10	Ū	10	U	
Vinyl ChlorideChloroethane		10	U	10	Ū	•
Chloroethane	4	10	U	10	U	
Methylene Chloride	· · · · · · · ·	6	В	4	J	
Acetone		10	U	10	U	
Carbon Disulfide		5	U	5	Ú	
1,1-Dichloroethene		92	*	5	Ū	
1,1-Dichloroethane		5	U	5	U	
1,2-Dichloroethene (total)	5	U		U	
Chloroform		5	U	5	U	
1,2-Dichloroethane		5	U	5	U	•
2-Butanone		10	U	10	U	
1,1,1-Trichloroethane		5 ·	U	5	U	
Carbon Tetrachloride		5	U	5	U	
Bromodichloromethane		5	U	5	Ü	٠ .
1,2-Dichloropropane		5	U	5	U	PJ 66 200
cis-1,3-Dichloropropene		5	U	5	U	
Trichloroethene		94	¥	5	U	
Dibromochloromethane		5	U	5	U	
1,1,2-Trichloroethane		5	U	5	U	
Benzene		.00	ł	5	U	
Trans-1,3-Dichloropropene		5	U	5	U	
Bromoform	· .	5	U	5	Ü	
4-Methyl-2-pentanone		10	บ	10	U	
2-Hexanone	·	10	U	10	U	
Tetrachloroethene		5	U	5	U	
1,1,2,2-Tetrachloroethane		5	U	5	U	
Toluene		99	ŧ	5	U	

Toluene *= Outside of EPA CLP QC limits.

RFW#: 99LVH505	-MB1 99	LVH507-MB1
----------------	---------	------------

Chlorobenzene	99	*	5	U	
Ethylbenzene	5	ប	5	IJ	
Styrene	5	U	5	U	
Xylene (total)	5	บ	5	U	

^{*=} Outside of EPA CLP QC limits.

2/11/00

Recra LabNet - Lionville Laboratory

GC SCAN

BOWMD1

001 MSD

SOIL

1.00

BOWMD2

SOIL

002

1.00

BOWMD3

SOIL

003

1.00

3

BOWMD4

SOIL

004

1.00

Report Date: 11/16/99 17:08 Client: TNU-HANFORD B99-078 Work Order: 10985-001-001-9999-00 RFW Batch Number: 9910L501 Page: 1

BOWMD1

001 MS

SOIL

1.00

	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
=#=====================================		=====fl===	.=====fl==:	fl	fl=	f1	f1
n-Propyl Alcohol		5.0 បៗ	93 🐉	103 %	5.0 U J	5.5 บา	T 5.0 UJ
Ethanol		5.0 U T	5.0 U	5.0 U	5.0 ບຸງັ		
	Cust ID:	_ BOWMD5	BOWMD6	BOWMD7	BOWMD8	BLK	BLK BS
Sample	RFW#:	005	006	007	800	99LLC168-MB1	99LLC168-MB1
Information	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
**=====================================		====fl===	======fl===	======fl===	=====£1=	fl	fl
n-Propyl Alcohol		5.0 U J	5.0 UJ	5.0 UJ	5.0 UJ	ט 5.0	131 %
Ethanol		5.0 U ว์	5.0 Uゴ	5.0 U J	5.0 ប រ	5.0 ซ	5.0 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

2/2/8

Cust ID:

RFW#:

D.F.:

Matrix:

BOWMD1

SOIL

001

1.00

Sample

Information

Recra LabNet - Lionville Laboratory

DIESEL RANGE ORGANICS BY GC

Report Date: 11/18/99 08:53 Work Order: 10985-001-001-9999-00 RFW Batch Number: 9910L501 Client: TNU-HANFORD B99-078

	Cust ID:	BOWMD1	BOWMD1	BOWND1	BOWMD2	BOMWD3	BOWMD4
Sample	RFW#:	001	001 MS	001 MSD	002	003	004
Information	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	10.0
	Units:	mg/kg	mg/kg	mg/kg	. mg/kg	mg/kg	mg/kg
Surrogate:	p-Terphenyl	65 %	62 %	50 %	66 %	80 %	D %
Diesel Range Orga	anics _	6.5	101	92 %	4.3 U	4.4 U	45 UR
Motor Oil		78	130	85	. 130	47 U	1100 7
					- · · · · · · · · · · · · · · · · · · ·		
	Cust th.	BOWND 5	BOWMD 6	BOWND7	BOMMDR	RI.K	RIK RS

	Cust ID:	BOWMD5	BOWMD6	BOWMD7	BOWMD8	BLK	BLK BS
Sample	RFW#:	005	006	007	008	99LE1311-MB1	99LE1311-MB1
Information	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	i.00	1.00	1.00	1.00	1.00	1.00
	Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Surrogate:	p-Terphenyl	77 %	87 %	77 %	80 %	93 %	94 %
		fl	=====f1==	=====fl==:	======f1	======f1	======fl
Diesel Range Organi	Cs	4.2 U	4.4 U	4.2 U	4.2 U	4.0 U	93 🖁
Motor Oil		39 J	47 U	45 U	45 U	42 U	42 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not requested. NS= Not spiked. %= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of Advisory limits.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



Chemical and Environmental Measurement Information

Recra LabNet Philadelphia **Analytical Report**

Client: TNU-HANFORD B99-078

RFW #: 9910L501

SDG/SAF #: H0590/B99-078

W.O. #: 10985-001-001-9999-00

Date Received: 10-23-99

GC/MS VOLATILE

Eight (8) soil samples were collected on 10-21-99.

The samples and their associated QC samples were analyzed according to criteria set forth in Recra OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 11-01-99.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- The cooler temperatures upon receipt have been recorded on the chain-of-custody. 1.
- The required holding time for analysis was met. 2.
- Non-target compounds were not detected in the samples. 3.
- 4. Two (2) of forty-two (42) surrogate recoveries were outside EPA QC limits. The analysis of sample B0WMD4 fulfills the reanalysis requirement for sample B0WMD4 RE.
- 5. All matrix spike recoveries were within EPA QC limits.
- All blank spike recoveries were within EPA QC limits. 6.
- The method blanks contained the common laboratory contaminants Methylene Chloride at levels 7. less than the CRQL. The method blank 99LVH505-MB1 also contained the target compound 2-Hexanone at a level less than the CRQL.

J. Michael Taylor Vice President

Philadelphia Analytical Laboratory

som\group\data\voa\tnu10501.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.



Chemical and Environmental Measurement Information

Recra LabNet Philadelphia **Analytical Report**

Client: TNU HANFORD B99-078

RFW #: 9910L501

SDG/SAF#: H0590/B99-078

W.O. #: #: 10985-001-001-9999-00

Date Received: 10-23-99

GC SCAN

The set of samples consisted of eight (8) soil samples collected on 10-21-99.

The samples and their associated QC samples were prepared on 11-03-99 and analyzed by methodology based on EPA Method 8015B for Ethanol and 1-Propanol on 11-04-99.

The following is a summary of the QC results accompanying these sample results and a description of any problems encountered during their analyses:

- The samples were packaged and stored as specified in the method protocol; the cooler 1. temperature upon receipt has been recorded on the chain-of-custody.
- 2. The required holding time for analysis was met.
- 3. All initial calibrations associated with this data set were within acceptance criteria.
- All continuing calibration standards analyzed prior to the sample extracts were within 4. acceptance criteria.
- 5. Surrogates were not used for this analysis.
- 6. All blank spike recoveries were within advisory control limits of 50%-150%.
- 7. All matrix spike recoveries were within advisory control limits of 50%-150%.

J. Michael Taylor Vice President

Philadelphia Analytical Laboratory

r:\share\ic\gescan\10-501.doc

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages. 000023



Chemical and Environmental Measurement Information

Recra LabNet Philadelphia Analytical Report

Client: TNU-HANFORD B99-078

W.O #: 10985-001-001-9999-00

RFW#: 9910L501

Date Received: 10-23-99

SDG/SAF#: H0590/B99-078

DIESEL RANGE ORGANICS

The set of samples consisted of eight (8) soil samples collected on 10-21-99.

The sample and its associated QC samples were prepared on 10-28-99 and analyzed by methodology based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 11-11,12-99. The analysis met the intent of method WTPH-D.

- 1. The cooler temperature has been recorded on the chain-of-custody.
- 2. All required holding times for extraction and analysis were met.
- 3. All initial calibrations associated with this data set were within acceptance criteria.
- 4. All diesel continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.
- 5. All obtainable surrogate recoveries were within acceptance criteria.
- 6. The blank spike recovery was within acceptance criteria.
- 7. All matrix spike recoveries were within acceptance criteria.

8. Sample BOWMD4 required a ten-fold instrument dilution due to the presence of high levels of target analytes.

J. Michael Taylor Vice President

Philadelphia Analytical Laboratory

R:\SHARE\LC\GCSCAN\10-501d.doc

11-22-99 Date

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages.

Bechtel Hanford	Inc.	0	CHAIN OF CUST	rody/s	AMPLI	E ANAL	YSIS F	REQUEST	r	B99	9-078-144	Page	[of]
Collector Bowers/Trice		Com Ch	pany Contact Iris Cearlock	Telephor 372-9:	ie No. 574		_þ	Project Coordi RENT, SJ	nator	Price Code	8N		Days
Project Designation 200 Area Source characterizat	tion - 200-CW-1 OU		pling Location 0 B pond					AF No. 399-078				4:	5 Days
ice Chest Na. CRC 99 01	2 /ERC99	OZ3 Field	Logbook No. 1511	•				dethod of Ship FED EX	panent				
Shipped To DMA/RECRAD # 10-1	1-97	Offsi	te Property No	·			E	Bill of Lading/	Air Bill No				
								COA B	20C	W 16	716	_	
POSSIBLE SAMPLE HAZAI	RDS/REMARKS	<u>-</u> -	Preservation	None	Cool 4C	None	Cool 4C	Cool 4C	Coal 4C	None			
•			Type of Container	∍G	₽G	∌G	•G	₽G	≱G	aG		1	
			No. of Container(s)	1		1	1	1	1	'			
Special Handling and/or Store	ec.		Volume	60mL	250mL	250mL	500mL	500mL	[000mL	1000mL	}		
. 000	sample ana	LYSIS		Inotopic Uranium	VOA - 8260A (TCL); VOA - 8260A (Add- On) { - Propanol, Ethanol}	pH (Soil) - 9045	See item (1) Special leasuctions	8270A (TCL);	See item (2) i Special featractions.	See item (3) in Special Instructions.			
Sample No.	Matrix *	Sample Date	Sample Time										
(YOWND)	Soil	10-31	19 1012		Χ	Χ_	Х	X	X		Bowgi	Ĭ	
Bom MD2	Soy	10-01-9	7 1017		Y	X	У	У	Y		Bowy	9	
BOWMD3	501	10-011	7 1047		Y	, X	<u> </u>	Х	<u> </u>		Bowgu	o	
BOWMD4	5-11	10-01-9	9 1102			L X	¥	X	×	<u> </u>	Bongo	vo	
govenos	501	10-01-90	2 1118	KF	<u> </u>	- X -	X	-	×	<u> </u>	Bowy		SAMPLES
CHAIN OF POSSESSION		Sign/Pris	nt Names	0.22.19		IAL, INSTRI		i on SAF 1999-078.			1	Matri Soil	x • ′
clinquished By 10 00 10 00 00 00 00 00 00 00 00 00 00	Date/Time	Received By Received By Received By Received By	10-11-19)	LeTime (400 cTime S 1027 Title Title	(1) K Seleni Vanad (2) N 9 (3) G Europ Total Ameri	CP Metals - 601 ium, Silver); IC lium, Zinc}; Mo O2/NO3 - 353. e}; Sulfides - 90 amma Spectros ium- 55}; Gam	OA (Supertr CP Metals - 6 ercury - 747 1; IC Anions 030; Ammo scopy (Cesiums Spec - /	race) {Arsenic, Bi 6010A (Supertrac 1 - (CV); Chromis s - 300.0 (Chloris nin - 350.3; Total um-137, Cobalt-6 Add-ou [Americi pic Plutonium; Ist	arium, Cadm :e Add-On) { :um Hex - 7 l de, Fluoride, l Cyanide - 9 0, Europium um-241}; St	Beryllium, Cop 96 Nitrate, Nitrite, 010 -152, Europium ontiam-89,90 -	per, Nickel, , Phosphate, -154, - Total Sr; 32);	Soil Water Vapor Other Soli Other Lig	

Bechtel Hanford	inc.	\ C	HAIN OF CUS	FODY/S/	MPL	E ANAL	YSIS R	EQUES?	r	В99	9-078-145	Page 1	ol <u>I</u> .
Collector Bowers/Trice			pany Contact ris Cearlock	Telephon 372-95	: No. 74		Pr	oject Co ordi LENT, SJ	nater	Price Code	8N		ernaround
Project Designation 200 Area Source characteriza	stion - 200-CW-1 OU	Sam 20	pling Location O B pond					F No. 9-078		•		45	Days C
ERC 96	·025		Logbook No. -1511			-		ethod of Ship FED EX	ment		<u></u>	······································	
Shipped To TMA/RECRA J 70 10 - 1		Offsi	le Property No.	vø E	<u> </u>	· · · · · · · · · · · · · · · · · · ·	Bi	ll of Lading//	Air Bill No 35	195	3 &	596	6
							\ c	COA Ba	064	1 6	7/6_		
Possible sample haza	ARDS/REMARKS		Preservation	None	None	None	None	Caol 4C	None	Cool 4C	Cool #C	Cool 4C	None
			Type of Container	#G	∌G	#G	₃G	aG	₽Ğ	aG	aĞ	aG	aG
		•	No. of Container(s)	'	1	1	Î	1] - 1	1.	, ,] '	
Special Handling and/or Stor	rage		Volume	60mL	60mL	60mL .	120mL	250mL	250ml.	500ml.	SOOmL	1000mL	1000mL
Sample No.	SAMPLE AN	ALYSIS	·	Isotopic Uranium	Nickel-63	Technetium-99	Tritium - 143	VOA - 9260A (TCL); VOA - 8260A (Add- On) [1-	pti (Soil) - 9045	See item (1) in Special Instructions.	Semi-VOA - 8270A (TCL); TPH-Diesel Range -	Set item (2) in Special Instructions.	Set item (3) in Special Instructions
Š		٠.	- ,					Propenot, Estamol)			WTPH-D; PCBs - 8082		
Sample No.	Matrix *	Sample Date	Sample Time		3/25/E				深 道[1100000	
How y Db	Soil	10-21-	99 1130					Х	Χı	<u> </u>	<u>_x_</u>	Χ.	
BOWM D7	501)	10-11	98 1140					У	X	X	<u> </u>	Х	
Borm D8	50,1	10-11-9	7 1150					У.	<u> X</u>	<u> </u>	<u> </u>	×	
										 	<u> </u>		
CHAIN OF POSSESSION		Sign/Pris	it Names	l.	See ch	AL INSTRU	cominents on					Matrix Soil Water	•
linguis ad By	>)-99/14/00 Dalg/Time	Received By	C 10-21-99/	.Т ине <u>/400</u> Ит. 94	Seleni Vanad (2) No	um, Silver}; fCl ium, Zinc}; Me D2/NO3 - 353.1	P Metals - 60 reury - 7471 - l; IC Anions -	10A (Supertract - (CV); Chromi 300.0 (Chlorid	e Add-On) (um Hex - 71 le, Fluoride,	Nitrate, Nitrite,	per, Nickel,	Vapor Other Solid Other Liquid	
COT COL 10 SAF	99/0800 Walanganga .9 1430		EX	e/Time	(3) Ga Europi Total I	umma Spectrosc um-155}; Gam Dranium (Urani	copy (Cesium ma Spec - Ad	d-on (Americiu), Europium m-241); St	o jo -) 52, Europium- ontium - 89,90 un (Thoriva-23	Total Sr;		
linopished By	Date/Time 23-99 1000	Received By	Date 10 - 3.49	Time 1000		r Bow	861 4	<u>s TA</u> .	<u> 54</u>				
ABORATORY Received By SECTION	<u> </u>	Ver III	J	Title					NOL	, う()	D	ate/Time	
INAL SAMPLE Disposal Met DISPOSITION	hod					Dispase	ed By		<u>. 17 7 24</u>		Di	ste/Time	
2101 0011-01-		** *****									E.		

Bechtel Hanford Inc.	CH	AIN OF CUST	rody/s	AMPL	E ANAL	YSIS	REQUES	r	B9	9-078-144	Page 1	of Ţ
Collector Bowers/Trice		y Contact Cearlock	· Telepho 372-9				Project Coordi TRENT, SJ	inator	Price Code	8N	Data To	rnaround 🗨
Project Designation 200 Area Source characterization - 200-CW-1 OU	Semplin	g Location *					SAF No. B99-07#					Days $\stackrel{\sim}{\subset}$
ERC 96.025	EL-15						Method of Shi FED EX	pment				
Shipped To TMA/REPRA \$ 18 12 - 21 - 99	Offsite P	Property No.	BO	55			A S C Madius	Air Bill N	795	3	ØC	166
							COA B	300	الندا	67	10	
POSSIBLE SAMPLE HAZARDS/REMARKS		Preservation	None	Cool 4C	None	Cool 4		Cool 4C	None			
	-	Type of Container	aG	.aG	3 G	₽G	aG	₽G	aG	1		
	- [No. of Container(s)	1	1	1	 	1	1	1			
Special Handling and/or Storage		Volume	60mL	250mL	250mL	500mi	, 500mL	1000mL	1000mL	1	1	
SAMPLE ANALYSIS	-		Isotopic Ursnium ,	VOA - 8260A (TCL); VOA - 8260A (Add- On) [1- Propend, Ethenol]	gH (Soil) - 9045	See item (1 Special Justruction	8270A (TCL);	Sot item (2) Special Instructions	Special			
	le Date	Sample Time						X 12.5 (1			21.11	
Bound D) alsoil)0.	71-99	1912	X.					المنتج. تامن الإيما	X	í	7779	0 10 10 7
Bounds of soil low	11-59	1017	X						Ι Ý.	Boy	مصدو ر	1
BOWMD3 8 Soit 10-7	1:11	1047	λ						20.ac	Dou	9 w 0	
BOWN 04 5011 10-	1.28	1102	X					BY	N. X		quo	
Bowmny 5011 10-2	1.79	1119	ν.						X	Bou	MD9	
CHAIN OF POSSESSION	ign/Print N	lames	,		IAL INSTR		S on SAF B99-078.		·	\$	Matrix Soil	
clinquished By 1) 0 49 13 on CP3 Date/Time Received Date/Time Party Date/Time Received	1 By 3 C	10-21-79 KiTinanenDai	Time	Seleni Vanad	um, Sílver); 10 ìum, 2inc); M 02/NO3 - 353.	CP Metals - ercury - 74 I; IC Anio	trace) (Arsenic, B 6010A (Supertrac 71 - {CV); Chromins - 300.0 {Chloric	e Add-On) (ium Hex - 7! de, Fluoride,	Beryllium, Cop 96 Nitrate, Nitrite,	per, Nickel,	Water Vapor Other Solid Other Liquid	, }
Thorn 1020.99/1430	EOE		e/Time	Europi Total I	umma Spectros um-155); Gast	copy (Cesi nan Spec -	onia - 350.3; Total ium-137, Cobalt-6 Add-on (Americi opic Plutonium; Is	0, Europium um-24 (); St	-152, Europium rontium-89,90	· Total Sc;		
LABORATORY Received By	Men	10:2399								. Di	Me/Time	
SECTION TINAL SAMPLE Disposal Method DISPOSITION					Dispos	ed By	<u> </u>	 -	······································	Da	ste/Time	

i

6

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	Α	В	()	D	E
PROJECT: 7	ου - (w -	(DATA PACKAGE	: Hosao	,
VALIDATOR:	TL1	LAB: Ke	-nA	DATE: 1/31	100
CASE:			SDG: HOS	590	
		ANALYSES	PERFORMED		
CLP Volatiles	SW-846 8240 (cap column)	(packed column)	CLP Semivolatiles	SW-846 8270 (cap column)	SW-846 (packed column)
SAMPLES/MATE	RIX BOWME	DI BOWM	DZ BUWA	40) BOWN	104
	1300.416	6	to a	γιση ροων	
	<u></u>	-		"	
		·	· ·		
	- <u>-</u>			· · · · · · · · · · · · · · · · · · ·	
Is technical		documentation	present? .	· · · · · · · · · · · ·	res No (N/A)
 :		<u> </u>			
		<u>.</u>			
	, ,	<u> </u>			
2. HOLDING 1	TIMES		_ 		
Are sample ho	olding times a	cceptable?			Yes No N/A
			-		
	· ·				
	<u> </u>				
	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	······································		· · ·

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION		\sim
Is the GC/MS tuning/performance check acceptable? Yes	No	N/A)
Are initial calibrations acceptable? Yes	No	(N/A)
Are continuing calibrations acceptable? Yes Comments:	No	MA
4. BLANKS		
Were laboratory blanks analyzed? Yes	No	N/A
Are laboratory blank results acceptable? Yes	NO	NTA
Were field/trip blanks analyzed? Yes	No	/ N/A
Are field/trip blank results acceptable? Yes	No /	N/A
Comments: mestylen Chlorid Dy-Valley ok - Uat 10 alleyton	<u> </u>	n and
2-herane Prot OK	<u> </u>	huri
5. ACCURACY		
Were surrogates/System Monitoring Compounds analyzed? Yes	No	N/A
Are surrogate/System Monitoring Compound recoveries acceptable? (Yes)	No	N/A
Were MS/MSD samples analyzed?	No	N/A
Are MS/MSD results acceptable? Yes	No	N/A
Comments:		
		
		
	<u> </u>	
<u> </u>		
		
		
•		

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION		
Are MS/MSD RPD values acceptable?	No	N/A
Are field duplicate RPD values acceptable? (Ýes)	No	N/A
Are field split RPD values acceptable? Yes	No	N/A
Comments:		
	· .	
		<u>-</u>
7. SYSTEM PERFORMANCE		
Were internal standards analyzed? Yes	No	N/A
Are internal standard areas acceptable? Yes	No	N/A
Are internal standard retention times acceptable? Yes	No	N/A
Comments:		
·		
8. COMPOUND IDENTIFICATION AND QUANTITATION		r
Is compound identification acceptable? Yes	No	N/A
Is compound quantitation acceptable? Yes	No	\N/A
Comments:		
		
9. REPORTED RESULTS AND QUANTITATION LIMITS		
Are results reported for all requested analyses?	No	N/A
Are all results supported in the raw data? Yes	No	
Do results meet the CRQLs? Yes	(No)	_
Has the laboratory properly identified and coded all TIC? Yes	No	
comments: Commen	~	7
Comments: Chloromethone, Dimomethone, unyl chlord, C In DI, DY, D8 Acetone - DI, DY, D8 2-Buteners - DI, 4 methyl 2 pontance, 7. Hereans - DI, DY, D8	<u> </u>	
4 methy 12 pontance, 7. Hereans - DI, DY, D8		

GENERAL GC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	В	(0)	D	Ε
PROJECT: 7	00-cw-1		DATA PACKAGE	: H059	0
VALIDATOR:	-	LAB: Rec		/	100
CASE:			SDG: Hos	5.90	
Diesola	horar oil	ANALYSES	PERFORMED		
□ 801 0	X8015 13	□ 802 0	□ 8021	8140	8141
□ 8150	☐ 8151	□ WTPH-HCID	□ WTPH-G	□ WTPH-D	0
0	٥	o	0	0	0
SAMPLES/MATE	IX: Bawn	DI Bdw nz	PZ BOUMD	3 BOWND	4
	Barns	5 Raymo	E BOWNDE	BUWMPS	
	00	<u> </u>	5 (30)p	(DO4) . F	
	 				
,	<u> </u>		· ·		
					501/
	verification rative presen		present? .		es No W/A es No N/A
2. HOLDING T Are sample ho Comments:	lding times a	cceptable? .	• • • • •	· · · · · · · (§	es No N/A
· · · · · · · · · · · · · · · · · · ·					
					·

A-16(

ひひひひつつ

3. INSTRUMENT CALIBRATION	
3.1 INITIAL CALIBRATION	\bigcirc
Was an initial calibration performed? Yes No.	O / N/A
Are %RSD values for calibration or response factors acceptable? Yes No.	o N/A
Comments:	\rightarrow
3.2 CONTINUING CALIBRATION	\wedge
Was a continuing calibration check performed? Yes N	0 / N/A
Are %D values for calibration or response factors acceptable? . Yes N	o (N/A)
Comments:	$\overline{}$
• • • • • • • • • • • • • • • • • • •	
	·
4. BLANKS	
Were laboratory blanks analyzed? (Yes) N	o N/A
Are laboratory blank results acceptable? Yes N	o N/A
Were field/trip blanks analyzed? Yes (N	o) NA
Are field/trip blank results acceptable? Yes N	N/A
Comments:	$\underline{\underline{}}$
	
'9	
	···
5. ACCURACY	
Were surrogates analyzed? Yes N	lo N/A
	N/A
and the second s	lo N/A
	io N/A
	lo (N/B)
	lo NA
	~

Comments: D4 - chilulal and
Diesel R
MO. J
6. PRECISION
Are MS/MSD sample RPD values acceptable?
Are field duplicate RPD values acceptable?
Are field split RPD values acceptable? Yes No N/A
Comments: Mata at APD 5090
7. COMPOUND IDENTIFICATION AND QUANTITATION
Is compound identification acceptable? Yes No
Is compound quantitation acceptable? Yes No \\N/A
Comments:
8. REPORTED RESULTS AND DETECTION LIMITS
Are results reported for all requested analyses?
Are all results supported in the raw data? Yes No NA
Do results meet the CRQLs? Yes No (N/A
Comments:

VALIDATION LEVEL:	A	В	(6)	D	E
PROJECT: 20	00cm-1		DATA PACKAGE	: 40590	
VALIDATOR:		LAB: Rec	RA	DATE: 1/3/	00
CASE:			SDG: HOS	90	
Alcohol	<u>-¥</u>	ANALYSES	PERFORMED		
D 8010	D8018/B	□ 802 0	□ 8021	8140	8141
D \$150	□ 8151	□ WTPH-HCID	□ WTPH-G	□ WTPH-D	0
0	0	0	0	0	0
SAMPLES/MATE	Bowma	101 (gac	MDC BO	WADS BIN	JAU F
Is technical	rative presen	documentation	present? .		
				·	
2. HOLDING T Are sample ho Comments:	lding times a			····/	res No N/A
				 	

3. INSTRUMENT CALIBRATION		
3.1 INITIAL CALIBRATION		, ^
Was an initial calibration performed? Yes	No	N/A
Are %RSD values for calibration or response factors acceptable? Yes	No	N/A
Comments:		
3.2 CONTINUING CALIBRATION	<u>.</u>	
Was a continuing calibration check performed? Yes	No	N/A
Are 4D values for calibration or response factors acceptable? . Yes Comments:	No	N/A
4. BLANKS Were laboratory blanks analyzed?	No	 N/A
Are laboratory blank results acceptable?	No	N/A
Were field/trip blanks analyzed? Yes	h No	N/A
Are field/trip blank results acceptable? Yes Comments:	No	N/A
,		
5. ACCURACY		
Were surrogates analyzed? Yes	No	> N/A
Are surrogate recoveries acceptable? Yes	No	
Were MS/MSD samples analyzed?) No	N/A
Are MS/MSD recoveries acceptable? Yes	No	N/A
Were LCS samples analyzed? Yes	No	MZA
Are LCS recoveries acceptable? Yes	No	NT)

6. PRECISION Are MS/MSD sample RPD values acceptable?
We wante was acceptable.
Are field duplicate RPD values acceptable? Yes) No N/A
Are field split RPD values acceptable? Yes No N/A
Comments:
7. COMPOUND IDENTIFICATION AND QUANTITATION
Is compound identification acceptable? Yes No N/A
Is compound quantitation acceptable? Yes No N/A
COMMETICS.
8. REPORTED RESULTS AND DETECTION LIMITS
Are results reported for all requested analyses? Yes No N/
Are all results supported in the raw data? Yes No
Do results meet the CRQLs? Yes No N/
Comments:
·
-
·

Date:

15 February 2000

To:

Bechtel Hanford, Inc. (technical representative)

From:

TechLaw, Inc.

Proiect:

200 Area Source Characterization - 200-CW-1 Operable Unit

Subject: Radiochemistry - Data Package No. H0590-TNU (SDG No. H0590)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0590-TNU which was prepared by Thermo NUtech (TNU). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B0WMD1	10/21/99	Soil	С	See note 1
BOWMD2	10/21/99	Soil	С	See note 1
BOWMD3	10/21/99	Soil	С	See note 1 & 3
B0WMD4	10/21/99	Soil	С	See note 1
B0WMD5	10/21/99	Soil	С	See note 1
BOWMD6	10/21/99	Soil	С	See note 1 & 2
BOWMD7	10/21/99	Soil	С	See note 1 & 2
BOWMD8	10/21/99	Soil	С	See note 1 & 2

^{1 -} Strontium-90; alpha spectroscopy (isotopic plutonium, isotopic thorium and americium-241); gamma spectroscopy; total uranium.

Data validation was conducted in accordance with the BHI validation statement of work and the 200-CW-1 Operable Unit RI/FS Work Plan and 216-B-3 RCRA TSD Unit Sampling Plan, DOE/RL-99-07, Draft B. Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers

Appendix 2. Summary of Data Qualification

Appendix 3. Qualified Data Summary and Annotated Laboratory Reports

Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation

Appendix 5. Data Validation Supporting Documentation

^{2 -} Tritium; nickel-63; technetium-99

^{3 -} Alpha spectroscopy (isotopic uranium)

DATA QUALITY OBJECTIVES

Holding Times

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months with analysis within 7 days of distillation for liquid scintillation counting.

All holding times were acceptable.

Blanks

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the RDL, the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All laboratory blank results were acceptable.

Accuracy

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample and matrix spike recovery range is 70-130% (80-120% for gamma spectroscopy). In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

Due to the sample not being analyzed with the SDG, the strontium-90 and gamma spectroscopy results in sample BOWMD2 were qualified as estimates and flagged "J".

Due to the LCS not being analyzed with the SDG, all americium-241 (aspec) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

Precision

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the CRDL and the RPD is less than 30 percent, the results are acceptable. If either activities are less then five times the CRDL, a control limit of less than or equal to two times the CRDL is used for samples and less than or equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD of 40%, all thorium-228 (aspec) results were qualified as estimates and flagged "J".

Due to an RPD of 43%, all thorium-230 (aspec) results were qualified as estimates and flagged "J".

Due to the duplicate not being analyzed with the SDG, all strontium-90 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples BOWMD1/BOWMD2) were submitted to RLN for analysis. The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

Detection Levels

Reported analytical detection levels are compared against contract required MDAs to ensure that laboratory detection levels meet the required criteria. The reported detection limit exceeded the contract required MDA for the following: Europium-152 in samples BOWMD1, BOWMD2, BOWMD3 and BOWMD4;

europium-155 in samples BOWMD1, BOWMD2, BOWMD3 and BOWMD5. Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific MDA.

Completeness

Data Package No. H0590 (SDG No. H0590) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to an RPD of 43%, all thorium-230 (aspec) results were qualified as estimates and flagged "J". Due to an RPD of 40%, all thorium-228 (aspec) results were qualified as estimates and flagged "J". Due to the duplicate not being analyzed with the SDG, all strontium-90 results were qualified as estimates and flagged "J". Due to the sample not being analyzed with the SDG, the strontium-90 and gamma spectroscopy results in sample BOWMD2 were qualified as estimates and flagged "J". Due to the LCS not being analyzed with the SDG, all americium-241 (aspec) results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

The reported detection limit exceeded the contract required MDA for the following: Europium-152 in samples BOWMD1, BOWMD2, BOWMD3 and BOWMD4; europium-155 in samples BOWMD1, BOWMD2, BOWMD3 and BOWMD5. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, Validation Statement of Work, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-99-07, Draft B, 200-CW-1 Operable Unit RI/FS Work Plan and 216-B-3 RCRA TSD Unit Sampling Plan.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

- Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ Indicates the compound or analyte was analyzed for and not detected at
 concentrations above the minimum detectable activity (MDA) in the
 sample. Due to a QC deficiency identified during the data validation, the
 associated quantitation limit is an estimate, but is usable for decision
 making purposes.
- Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.
- UR Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

Appendix 2
Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0590	REVIEWER: TLI	DATE: 2/15/00	PAGE_1_OF_1							
COMMENTS:										
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON							
Thorium-228 (aspec)	J	All	RPD							
Thorium-230 (aspec)	J	All ,	RPD							
Americium-241(aspec)	J	All	LCS not analyzed w/SDG							
Strontium-90	J	All	Duplicate not analyzed w/SDG							
Strontium-90, gamma spectroscopy	J	BOWMD2	Sample not analyzed w/SDG							

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD]													
Laboratory: TNU																	
Case	SDG: HO	SDG: H0590						<u>,</u>						,			
		BOWMD1			BOWMD3_		BOWMD4		BOWMD5		BOWMD6		B0WMD7		BOWMD8		
		B Pond			_	B Pond		B Pond		B Pond		8 Pend		B Pond		B Pond	
Remarks				Duplicate										<u> </u>			
Sample Date		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99		10/21/99	
Radiochemistry	CRDL	Result	Q	Result	۵	Result	Q	Result	<u>a</u>	Result	O.	Result	Q	Result	a		0
Tritium	400	NA.		NA NA		NA.		NA.	<u> </u>	NA.		-0.048	₩	-0.026	-	-0.051	+
Technetium-99	15	NA.		NA.	L	NA.	_	NA.	<u> </u>	NA.	<u> </u>	-0.101	U	0.114	U	-0.123	끄
Total Uranium*	1	1.33		0.560	L	2.38		0.692	L_	0.507		0.384	╙	0.350		0.326	┖
Plutonium-238	1	0.005	U	0.017	b	0.003	υ	0.009	U	0.003	U	0.007	U	0	U	0.003	U
Plutonium-239/240	1	0.126		0.114		0.024	υ	0.122	L_	0.058	_	-0.007	U	0	U	0.019	ln.
Nickel-63	30	NA.		NA		NA.	<u> </u>	NA.	L_	NA		0.427	U	0.688	U	0.613	
Americium-241	1	0.966	J	1.14	ارجا	0.337	J	1.32	î_	0.381	J	0.037	กา	0.013	UJ	0.015	υJ
Total Strontium	1	12100	j	9950	ے ا	1580	J	996	î_	364	J	4.03	1	4.82	_	0.656	ᆚ
Thorium-228		0.414	J	0.845	5	0.204	J	0.867	J_	0,528	J	0.378	J	0.347	Į	0.386	1
Thorium-230		0.458	J	0.861	٦	0.310	J	0.797	J_	0.536	J	0.506	J	0.680	j	0.150	UJ
Thorium-232	1	0.428		0.684		0.229		0,866		0.552		0.356		0.371		0.246	L
Potassium-40		13.3		13.4	5	12.5		13.3	_	11.7		12.4	<u> </u>	12.8	L	13.4	L
Cobalt 60	0.1	U	v	U	3	U	U.	U	U_	υ	υ	· U	υ	U	U	U	Ų.
Cesium 137	0.1	721		746	-	13.4		103	<u> </u>	20.4		0.157	_	0.472	L	0.075	L
Енгоріал 152	0.2	Ü	υ	Ü	3	ប	υ	υ	υ	υ	υ	υ	υ	υ	υ	<u> </u>	ļυ_
Europium 154	0.2	1.82		1.87	٦,	0.538		2.34	_	0.301		U	U	U	υ		U
Europium 155	0.1	U	Ų	U	3	υ	υ	2.04		0.241	U	U	U	U	U	U	U.
Radium-226		0,650		0.690	٦,	0.690		0.740	L_	0,520	<u> </u>	0.484	_	0.369	_	0.452	<u> </u>
Radium-228	i -	0.718		0.699	اجا	1.00	L	0.819	L	0.748		0.782		0.606		0.697	L
Thorium-228		1.05		0.819	٦	0.994		0.863	L_	0,608		0.678	_	0.541	<u> </u>	0.653	↓_
Thorium-232	1	0.718		0.699	ر ا	1.00		0.819	L_	0.748	<u> </u>	0,782	_	0.606	-	0,697	↓_
Americium-241 (gea)		U	U	U	บJ	U	U	U	U	U	U		บ		U	, , u	+
Uranium-238 (gea)	1	V	U	U	IJ	U	υ	U	U_		U		υ		U		U
Uranium-235 (gea)	1	U	U	U	υJ	U	U	U	U_	U	Ų.	U	U	<u> </u>	-	· · · · · · · · · · · · · · · · · · ·	<u>u</u>
Uranium-233 (Aspec)		NA		NA	L.	0.585		NA.	_	NA.	<u> </u>	NA	\vdash	NA.	-	NA NA	⊢
Uranium-235 (Aspec)	1	NA		NA		0.040	L	NA NA		NA		NA.	L	NA.	<u> </u>	NA.	Ļ
Uranium-238 (Aspec)		NA		NA		0.564		NA.		NA		NA	<u> </u>	NA.	_	NA.	Ļ
	1				Ī							<u> </u>			1	 	1
* - Units are UG/G											<u> </u>	<u></u>					<u>_</u>

DATA SHEET

- [
	7257 Melissa C. Mannion	Client/Case no Contract	<u>Hanford</u> <u>SDG H0590</u> <u>TRB-SBB-207925</u>
	·		
Į			

ANALYTE	CAS NO	RESULT pCi/g	20 ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total Uranium (ug/g)	7440-61-1	1.33	0.17	0.005	1.0		υ_т
Plutonium 238	13981-16-3	0.005	0.011	0.026	1.0	ָּטַ	PU
Plutonium 239/240	PU-239/240	0.126	0.038	0.030	1.0	K# _	PU
Americium 241	14596-10-2	0.966	0.15	0.037	1.0	in I	AM
Total Strontium	SR90	12100	130	2.8	1.0	1	SR
Thorium 228	14274-82-9	0.414	0.14	0.13	1.0	10 J	TH
Thorium 230	14269-63-7	0.458	0.15	0.17	1.0	10 1	TH
Thorium 232	TH-232	0.428	0.12	0.057	1.0	17	TH
Potassium 40	13966-00-2	13.3	0.78	0.41		• •	GAM
Cobalt 60	10198-40-0	U		0.040	0.050	U	GAM
Cesium 137	10045-97-3	721	0.80	0.2 9 _	0.10		GAM
Europium 152	14683-23-9	บ		0.82	0.10	U	GAM
Europium 154	15585-10-1	1.82	0.18	0.19	0.10		GAM
Europium 155	14391-16-3	บ		2.5	0.10	บ	GAM
Radium 226	13982-63-3	0.650	0.21	0.31	0.10		GAM
Radium 228	15262-20-1	0.718	0.27	0.35	0.20		GAM
Thorium 228	14274-82-9	1.05	0.30	0.45			GAM
Thorium 232	TH-232	0.718	0.27	0.35			GAM
Americium 241	14596-10-2	ט		24		U	GAM
Uranium 238	U-238	U		8.3	•	ט	GAM
Uranium 235	15117-96-1	Ū		1.1		U	GAM

200 Area Soure Chara. - 200-CW-1 OU

Per 2/11/00

DATA SHEETS
Page 1
SUMMARY DATA SECTION
Page 21

DATA SHEET

\$	7257 Melissa C. Mannion	Client/Case no Contract	Hanford SDG H0590 TRB-SDB-207925
1		Client sample id Location/Matrix Collected Custody/SAF No	200 B Pond SOLID 10/21/99 10:17

analyte	CAS NO	RESULT pCi/g	2 FRR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TES T
Total Uranium (ug/g)	7440-61-1	0.560	0.072	0.005	1.0	#	U_T
Plutonium 238	13981-16-3	0.017	0.021	0.038	1.0	ับ	₽Ū
Plutonium 239/240	PU-239/240	0.114	0.042	0.038	1.0	#	PU
Americium 241	14596-10-2	1.14	0.17	0.045	1.0	T	AM
Total Strontium	SR90	9950	160	6.7	1.0	W.J.	SR
Thorium 228	14274-82-9	0.845	0.19	0.14	1.0	# J	TH
Thorium 230	14269-63-7	0.861	0.19	0.15	1.0	加工	TH
Thorium 232	TH-232	0.684	0.15	0.065	1.0	4	TH
Potassium 40	13966-00-2	13.4	0.72	0.47		΄ Τ	GAM
Cobalt 60	10198-40-0	ט		0.047	0.050	ט (GAM
Cesium 137	10045-97-3	746	1.1	0.38	0.10	1	GAM
Europium 152	14683-23-9	u		1.1	0.10	ט	GAM
Europium 154	15585-10-1	1.87	0.25	0.24	0.10		GAM
Europium 155	14391-16-3	ט		2.8	0.10	ט	GAM
Radium 226	13982-63-3	0.690	0.33	0.46	0.10	ľ	GAM
Radium 228	15262-20-1	0.699	0.33	0.41	0.20	1	GAM
Thorium 228	14274-82-9	0.819	0.38	0.56			GAM
Thorium 232	TH-232	0.699	0.33	0.41		ĺ	GAM
Americium 241	14596-10-2	ប		3.7		ש	GAM
Uranium 238	U-238	ซ		11	•	, ט	GAM
Uranium 235	15117-96-1	บ		1.8		υV	GAM

200 Area Soure Chara. - 200-CW-1 OU

2/11/00

DATA SHEETS
Page 2
SUMMARY DATA SECTION
Page 22

DATA SHEET

ł	7257	Client/Case no	<u>Hanford</u> <u>SDG H0590</u>
	Melissa C. Mannion	Contract	<u>TRB-SBB-207925</u>
(Client sample id Location/Matrix Collected Custody/SAF No	200 B Pond SOLID 10/21/99 10:47

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TES T
Uranium 233	U233/234	0.585	0.059	0.017	1.0	<i>*</i>	Ū
Uranium 235	15117-96-1	0.040	0.016	0.012	1.0	1	ט
Uranium 238	U238	0.564	0.057	0.018	1.0	₩	U
Total Uranium (ug/g)	7440-61-1	2.38	0.30	0.005	1.0		U_T
Plutonium 238 🕠	13981-16-3	0.003	0.012	0.023	1.0	U	PU
Plutonium 239/240	PU-239/240	0.024	0.018	0.029	1.0	U	PU
Americium 241	14596-10-2	0.337	0.082	0.042	1.0	声丁	MA
Total Strontium (SR90	1580	61	3.4	1.0	5	SR
Thorium 228	14274-82-9	0.204	0.11	0.16	1.0	MI	TH
Thorium 230	14269-63-7	0.310	0.15	0.16	1.0	₽ 7	TH
Thorium 232	TH-232	0.229	0.098	0.062	1.0	A	TH
Potassium 40	13966-00-2	12.5	0.81	0.43			GAM
Cobalt 60	10198-40-0	ט		0.044	0.050	U	GAM
Cesium 137	10045-97-3	13.4	0.19	0.11	0.10		GAM
Europium 152	14683-23-9	ט	4	0.30	0.10	U	GAM
Europium 154	15585-10-1	0.538	0.20	0.19	0.10		GAM
Europium 155	14391-16-3	ט		0.47	0.10	U	GAM
Radium 226	13982-63-3	0.690	0.15	0.16	0.10		GAM
Radium 228	15262-20-1	1.00	0.35	0.32	0.20		GAM
Thorium 228	14274-82-9	0.994	0.17	0.21			GAM
Thorium 232	TH-232 '	1.00	0.35	0.32			GAM
Americium 241	14596-10-2	σ		0.52		Ū	GAM
Uranium 238	U-238	บ		8.7		U	GAM
Uranium 235	15117-96-1	U		0.64		บ	GAM

200 Area Soure Chara. - 200-CW-1 OU

2/11/00

DATA SHERTS
Page 3
SUMMARY DATA SECTION
Page 23

DATA SHEET

	7257	Client/Case no	<u>Hanford</u> <u>SDG H0590</u>
	Melissa C. Mannion	Contract	<u>TRB-SEB-207925</u>
Lab sample id Dept sample id Received	7257-00 4 10/25/99	Client sample id Location/Matrix Collected Custody/SAF No	200 B Pond SOLID 10/21/99 11:02

ANALYTE	CAS NO	RESUL T pCi/g	2ø ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TES1
Total Uranium (ug/g)	7440-61-1	0.692	0.089	0.005	1.0	/ U	U_T
Plutonium 238	13981-16-3	0.009	0.018	0.028	1.0	' u	υq
Plutonium 239/240	PU-239/240	0.122	0.042	0.033	1.0	1 -	PU
Americium 241	14596-10-2	1.32	0.16	0.056	1.0	I	AM
Total Strontium	SR90	996	36	4.6	1.0	于	SR
Thorium 228	14274-82-9	0.867	0.19	0.18	1.0	1 2	TH
Thorium 230	14269-63-7	0.797	0.19	0.15	1.0	AJ	TH
Thorium 232	TH-232	0.866	0.18	0.083	1.0	<i>*</i>	TH
Potassium 40	13966-00-2	13.3	0.87	0.51		•	GAM
Cobalt 60	10198-40-0	U		0.047	0.050	U	GAM
Cesium 137	10045-97-3	103	0.50	0.19	0.10		GAM
Europium 152	14683-23-9	σ		0.55	0.10	U	GAM
Europium 154	15585-10-1	2.34	0.24	0.21	0.10		GAM
Europium 155	14391-16-3	2.04	0.41	<u>0.59</u>	0.10		GAM
Radium 226	13982-63-3	0.740	0.23	0.31	0.10		GAM
Radium 228	15262-20-1	0.819	0.22	0,26	0.20		GAM
Thorium 228	14274-82-9	0.863	0.20	. 0.28			GAM
Thorium 232	TH-232	0.819	0.22	0.26			GAM
Americium 241	14596-10-2	ช		1.9		U	GAM
Uranium 238	U-238	ช		8.3		U	GAN
Uranium 235	15117-96-1	ช		0.78		Ū	GAM

200 Area Soure Chara. - 200-CW-1 OU

2/11/00

DATA SHEETS

Page 4

SUMMARY DATA SECTION

Page 24

DATA SHEET

ľ	7257 Melissa C. Mannion	Client/Case no Contract	Hanford TRB-SBB-207925	SDG H0590
Lab sample id Dept sample id Received * solids	7257-005 10/25/99	Client sample id Location/Matrix Collected Custody/SAF No	200 B Pond 10/21/99 11:18	SOLID

ANALYTE	CAS NO	RESUL T pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	Test
Total Uranium (ug/g)	7440-61-1	0.507	0.10	0.005	1.0	15-	U_T
Plutonium 238	13981-16-3	0.003	0.011	0.021	1.0	ซ	υq
Plutonium 239/240	PU-239/240	0.058	0.028	0.027	1.0	<i>[</i> 4	PU
Americium 241	14596-10-2	0.381	0.087	0.051	1.0	m J	AM
Total Strontium	SR90	364	1.6	0.10	1.0	T	SR
Thorium 228	14274-82-9	0.528	0.16	0.18	1.0	# J	TH
Thorium 230	14269-63-7	0.536	0.16	0.16	1.0	# J	TH
Thorium 232	TH-232	0.552	0.13	0.062	1.0	Je .	TH
Potassium 40	13966-00-2	11.7	0.55	0.25			GAM
Cobalt 60	10198-40-0	U		0.028	0.050	U	GAM
Cesium 137	10045-97-3	20.4	0.17	0.060	0.10		GAM
Europium 152	14683-23-9	ប		0.18	0.10	U	GAM
Europium 154	15585-10-1	0.301	0.12	0.13	0.10		GAM
Europium 155	14391-16-3	0.241	0.17	0.27	0.10	Ü	GAM
Radium 226	13982-63-3	0.520	0.084	0.095	0.10		GAM
Radium 228	15262-20-1	0.748	0.13	0.13	0.20		GAM
Thorium 228	14274-82-9	0.608	0.062	880.0			GAM
Thorium 232	TH-232	0.748	0.13	0.13			GAM
Americium 241	14596-10-2	U		0.62		U	GAM
Uranium 238	บ-238	υ		4.1		U	GAM
Uranium 235	15117-96-1	ט		0.30		שׁ	GAM

200 Area Soure Chara. - 200-CW-1 OU

2/11/00

DATA SHEETS
Page 5
SUMMARY DATA SECTION
Page 25

DATA SHEET

1	7257 Melissa C. Mannion	Client/Case no Contract	Hanford S TRB-SBB-207925	EDG H0590
§		Client sample id Location/Matrix Collected Custody/SAF No	200 B Pond 10/21/99 11:30	SOLID

ANALYTE	CAS NO	RESULT pCi/g	2ø ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	-0.048	0.057	0.099	400	U	н
Technetium 99	14133-76-7	-0.101	0.27	0.62	15	บ	TC
Total Uranium (ug/g)	7440-61-1	0.384	0.049	0.005	1.0	10	U_T
Plutonium 238	13981-16-3	0.007	0.007	0.027	1.0	ับ	บร
Plutonium 239/240	PU-239/240	-0.007	0.014	0.039	1.0	ซ	PU
Nickel 63	13981-37-8	0.427	1.4	2.3	30	σ	NI_L
Americium 241	14596-10-2	0.037	0.037	0.052	1.0	υJ	AM
Total Strontium	SR90	4.03	0.17	0.090	1.0	Ť	SR
Thorium 228	14274-82-9	0.378	0.17	0.20	1.0	14 J	TH
Thorium 230	14269-63-7	0.506	0.20	0.23	1.0		TH
Thorium 232	TH-232	0.356	J.13	0.12	1.0	11 3	TH
Potassium 40	13966-00-2	12.4	0.86	0.22		•	GAM
Cobalt 60	10198-40-0	บ		0.022	0.050	U	GAM
Cesium 137	10045-97-3	0.157	0.028	0.031	0.10		GAM
Europium 152	14683-23-9	ซ		0.057	0.10	U	GAM
Europium 154	15585-10-1	ប		0.079	0.10	ซ	GAM
Europium 155	14391-16-3	u .		0.093	0.10	ប	GAM
Radium 226	13982-63-3	0.484	0.048	0.044	0.10		GAM
Radium 228	15262-20-1	0.782	0.10	0.093	0.20		GAM
Thorium 228	14274-82-9	0.678	0.034	0.027	•		GAM
Thorium 232	TH-232 ,	0.782	0.10	0.093			GAM
Americium 241	14596-10-2	ช		0.033		U	GAM
Uranium 238	บ-238	ឋ		2.9		U	GAM
Uranium 235	15117-96-1	ប		0.090		ช	GAM

200 Area Soure Chara. - 200-CW-1 OU

2/11/00

DATA SHEETS
Page 6
SUMMARY DATA SECTION
Page 26

DATA SHEET

)	7257 Melissa C. Mannion	Client/Case no Contract	Hanford TRB-SBB-207925	SDG_H0590
i				SOLID

ANALYTE	CAS NO	RESUL T pCi/ g	2d ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	-0.026	0.061	0.10	400	U	н
Technetium 99	14133-76-7	0.114	0.31	0.63	15	บ	TC
Total Uranium (ug/g)	7440-61-1	0.350	0.046	0.005	1.0	/	U_T
Plutonium 238	13981-16-3	0	0.007	0.026	1.0	/ 0	PU
Plutonium 239/240	PU-239/240	0	0.013	0.032	1.0	บ	PU
Nickel 63	13981-37-8	0.688	1.3	2.2	30	υ	NI_L
Americium 241	14596-10-2	0.013	0.013	0.025	1.0	υJ	AM
Total Strontium	SR90	4.82	0.25	0.13	1.0	Ī	SR
Thorium 228	14274-82-9	0.347	0.17	0.23	1.0	NO 5	TH
Thorium 230	14269-63-7	0.680	0.22	0.18	1.0	MJ	TH
Thorium 232	TH-232	0.371	0.15	0.095	1.0	*	TH
Potassium 40	13966-00-2	12.8	0.45	0.15	•	•	GAM
Cobalt 60	10198-40-0	U		0.020	0.050	ប	GAM
Cesium 137	10045-97-3	0.472	0.029	0.023	0.10		GAM
Europium 152	14683-23-9	ט	•	0.050	0.10	U	GAM
Europium 154	15585-10-1	U.		0.070	0.10	Ū	GAM
Europium 155	14391-16-3	ט		0.051	0.10	ប	GAM
Radium 226	13982-63-3	0.369	0.039	0.038	0.10		GAM
Radium 228	15262-20-1	0.606	0.090	0.083	0.20		GAM
Thorium 228	14274-82-9	0.541	0.027	0.026			GAM
Thorium 232	TH-232	0.606	0.090	0.083			GAM
Americium 241	14596-10-2	ט		0.064		ប	GAM
Uranium 238	U-238	ช		2.4		ט	GAM
Uranium 235	15117-96-1	U		0.074		U	GAM

200 Area Soure Chara. - 200-CW-1 OU

Pluloc

DATA SHEETS
Page 7
SUMMARY DATA SECTION
Page 27

DATA SHEET

	•				1
1	SDG	7257	Client/Case no	Hanford SDG	H05 90
	Contact	Melissa C. Mannion	Contract	TRB-SBB-207925	
	Lab sample id	N910196-08_	Client sample id	BOWMD8	
	Dept sample id	7257-008	Location/Matrix	200 B Pond	SOLID
	Received	10/25/99	Collected	10/21/99 11:50	
	♣ solids	94.9	Custody/SAF No	B99-078-145 -B99-078	
ı					

ANALYTE	CAS NO	RESUL T pCi/g	20 ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Tritium	10028-17-8	-0.051	0.058	0.10	400	U	H
Technetium 99	14133-76-7	-0.123	0.18	0.53	15	U	TC
Total Uranium (ug/g)	7440-61-1	0.326	0.042	0.005	1.0	/ ◆	U_T
Plutonium 238	13981-16-3	0.003	0.006	0.021	1.0	ับ	PU
Plutonium 239/240	PU-239/240	0.019	0.017	0.021	1.0	U	PU
Nickel 63	13981-37-8	0.613	1.4	2.3	30	บ	NI_I
Americium 241	14596-10-2	0.015	0.022	0.028	1.0	υJ	AM
Total Strontium	SR90	0.656	0.12	0.13	1.0	16 J	SR
Thorium 228	14274-82-9	0.386	0.17	0.21	1.0	18 5	TH
Thorium 230	14269-63-7	0.150	0.13	0.20	1.0	ับ ปี	TH
Thorium 232	TH-232	0.246	0.11	0.12	1.0		TH
Potassium 40	13966-00-2	13.4	0.77	0.19		•	GAM
Cobalt 60	10198-40-0	Ū		0.023	0.050	ט	GAM
Cesium 137	10045-97-3	0.075	0.020	0.025	0.10	US	GAM
Europium 152	14603-23-9	ับ		0.048	0.10	ับ	GAM
Europium 154	15585-10-1	ਧ		0.071	0.10	ซ	GAM
Europium 155	14391-16-3	ซ		0.050	0.10	U	GAM
Radium 226	13982-63-3	0.452	0.045	0.043	0.10		GAM
Radium 228	15262-20-1	0.697	0.11	0.10	0.20		MAĐ
Thorium 228	14274-82-9	0,653	0.031	0.024	•		GAM
Thorium 232	TH-232 ,	0.697	0.11	0.10			GAM
Americium 241	14596-10-2	ช		0.028		U	GAM
Uranium 238	U-238	ช		2.4		U	GAM
Uranium 235	15117-96-1	ซ		0.081		ซ	GAM

200 Area Soure Chara. - 200-CW-1 OU

2/11/00

DATA SHEETS
Page 8
SUMMARY DATA SECTION
Page 28

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Page 1 of 2

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0590 was composed of eight solid samples designated under SAF No. B99-078 with a Project Designation of: 200 Area Source Characterization – 200-CW-1 OU.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Thermo Retec Sample Receipt Checklist. The results were transmitted to BHI via facsimile on January 7, 11, and 12, 2000.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

No problems were encountered during the course of the analyses.

2.2 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.3 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.4 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.5 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.6 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.7 Isotopic Uranium Analyses

BHI requested sample B0WMD3 be analyzed for Isotopic Uranium on January 6, 2000. Sample B0WMD3 was batched with SDG H0562 (7231). All QC samples are in SDG H0562. The sample duplicate was of a sample from SDG H0562. No problems were encountered during the course of the analyses.

2.8 Isotopic Piutonium Analyses

No problems were encountered during the course of the analyses.

2.9 Americium-241 Analyses

No problems were encountered during the course of the analyses.



Bechtel Hanford Inc. SDG H0590

Case Narrative

Page 2 of 2

2.10 Gamma Spec Analyses

No problems were encountered during the course of the analyses.

Collector Bowers/Trice	••		any Contact is Cearlock	. Telepho 372-9	ne No. 574			Project Coordi	nator	Price Code	8N	Date Tu	rnarou
Project Designation 200 Area Source characteriza	tion - 200-CW-L OU		ing Location B pond					SAF No. B99-078		•		45	Day
FRC 96	140		Logbook No. 1511					Method of Ship FED EX	ment		·· .		
Shipped To TMA/REPRA \$ 18 F	· · ·	Offsite	Property No.	800	1			Bill of Lading/	Air Bill N	5795		09	85
	• •							COA B	206	البيا	0716		
POSSIBLE SAMPLE HAZA	RDS/REMARKS		Preservation	None	Cool 4C	None	Cool 40	Cool 4C	Cool 4C	None			
			Type of Container	*G	#G	*0	#G	aG	₽G	∌G	 		
		_	No. of Container(s)	1	. 1	1	1	1	1				
Special Handling and/or Stor	age	•	Volume	60mL	250mL	250mL	500ml	. 500mL	1000mT	1000mL			
				- botopic Uranism	VOA - \$260A (TCL); VOA -	pH (Soil) - * 9045	See item (1) Special	8270A (TCL)	Special	in Ses item (3) in Special			1
	. Sample and	LYSIS	•		8260A (Add- Ow) (1- Propendi,		Instruction	us. TPH-Diesel* Runge - WTPH-D;	instruction	A, finaltrycticus.			
			•		Ethenol}		}.	PCBs - 8002		1			
Sample No.	Matrix •	Sample Date	Sample Time		SEE IN			28 国际企	100 500			2000	33
Bownn)	Soil	170 11 1	9 1012	X		<u> </u>	·			<u> </u>	Bov	19T9	8 14
Bownoa	Soil	10-017	9 1017	X	· · ·	ļ			 	- -X		مسده ر	79
BOWM DJ	50,4	10-21-7	1 1047	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			-	a Ci	 	<u> </u>	Sou	 	
Bawans	5 <i>0;</i>)	10-71.7	1 102			R41	p.29	<u> </u>		- X		MD9	
CILL DI OR DOCCESSION	301	Sian (Da)	-17/	- y -		IAL INSTR		S on SAF B99-078		<u> </u>	1 100	Matrix	<u> </u>
Relinquished By Doug Bours	- 1	Sign/Pri	3C 10-21-9		(1) Id Selen	CP Metals - 60 ium, Silver}; I	10A (Super CP Metals -	trace) (Arsenic, I 6010A (Supertra 171 - (CV); Chron	Barium, Cad ce Add-Os)	(Beryllium, Cor	n, Lead, sper, Nickel,	Soil Water Vapor Other Solid	
Relinquished By	Dete/Timé 상급국역 수당	Received By Z	inkithareno		(2) N Sulfa	102/NO3 - 353 te}; Sulfides - 1).1; 1C Anio 9030; Amm	ns - 300.0 {Chlor onia - 350.3; Tota	ide, Fluoride Il Cyanide -	t, Nitr ate, Nitrite 9010	` ' ' ' {	Other Liquis	•
R. STLORER	10-8248/14	30 FED	EK 10	ate/Time 3 – 7.2. ≃	Euroj Total	oium-155); Ga	mma Spec -	ium-137, Cobalt- Add-on (Americ opic Plutonium; I	ium-241); S	trontium-89,90 -	- Total Sr;		
Relinquished By Fall Ex	Date/Time D-23-99 12;	Received By	us JRGrs	ito/Time 9:									
LABORATORY Received By SECTION	,			Ti	irle						D	Date/Time	
FINAL SAMPLE Disposal M	A-4					Die	sed By					Date/Time	

		l l	•		~		3 WIW	1010	KŁŲUE	ST	B99	-078-144	Page 1	of]
	Collector Bowers/Trice	·		any Contact is Cearlock	. Telepho 372-9				Project Coor TRENT, SJ	dinator	Price Code	8N	Data Tu	rnaround
	Project Designation 200 Area Source characteriza	ation - 200-CW-1 OU	Sampi 200	ing Location B pond					SAF No. B99-078		•	·	45	Days
	SML 35	7	Field 1	ogbook No.	•	· 	 -		Method of St FED EX	ipment				
	Shipped To TMA/REPRA \$ 18 %	21-99		Property No.	1			`	Bill of Lading	Alr Bill N	1950	3 (397	7
		•			• ,			,	COV	20	cwi	10-	110.	
1	POSSIBLE SAMPLE HAZA	rds/remarks		Preservation	None	Cool 4C	None	Cool 4		Coal 40				
į	٠			Type of Container	aG .	∌G ·	÷G	aG	•G	3G	øG			
	•	·	ž,	No. of Container(s)		1	1	1	· .	1	'			
.	Special Handling and/or Stor	rage	· •	Volume	Je00	250mL	250mL	500m	L SOOmL	1000ml	1000mL			ļ
00002		SAMPLE ANA	LYSIS		Indopie Uranium	VOA - 8260A (TCL); VOA - 8260A (Add- On) {t- Propenol, Edmon)}	pH (Soil) = ** 9945	See item (Specie Instructio	\$270A (TCL	Special Instruction	Special			
3	Sample No.	Matrix *	Sample Date	Sample Time	20504			SE NO						
	Bounn)	. Soil		9 1012	X		Man profile	19 4 2			7		79T9	
۲	Bowmoa	36A9	100017	, 1017	ĬŽ.				- 	1	T X	aBov		79
۲	BOWND3 BT	5011.	10-71-1	1 1047	χ,						A , X22	Pou		
ķ	BOWN04	50%	10-21.9	9 1102	λ.							1 1	owe	
۰	BowAnn	50,7	10-21-7	1118 8		<u> </u>		<u> </u>			1x'	Bou	MD9	
	CHAIN OF POSSESSION		Siga/Pris	it Names			IAL INSTRI Lain of custody		KS s on SAF B99-07	18.		}	Matrix Soil	•
	Relinquished By	10-21-97/140 Date/Time	Received By	3C 10-21-7	11/40 11/40 18Times - T	Selen Vana (2) N	ium, Silver); I(dium, Zinc); M lOZ/NO3 - 353	CP Metals ferency - 7 .1; IC Ani	- 6010A (Superti 471 - (CV); Chro	ace Add-On) mium Hex - xide, Fluorid	e, Nitr <mark>ate, Nitrite</mark>	per, Nickel,	Water Vapor Other Solid Other Liquid	
	Refinquished By Refinquished By Refinquished By	Date/Time /Z.	Received By Or-Received By	EX 10/27	nte/Time 195	(3) C Eurog Total	iamma Spectro nium-{55}; Gaz	scopy (Ce suma Spec	sium-137, Cobel - Add-on (Amer	-60, Europiu icium-241); :	m-152, Europium Strontium-89,90 - rium (Thorium-2	- Total Sr		
	LABORATORY Received By SECTION	10/23/99	TNU H	y oranisty	//28/ <u>/</u> Ti	フ」 lk		, <u></u>	 _			D	alc/Time	
	FINAL SAMPLE Dispused M DISPOSITION	ethod					Dispo	sed By	·			D	ste/Time	
						*******							•	

	Bechtel Hanford	i Inc.	C	HAIN OF CUS	FODY/S	AMPL	E ANAL	YSIS I	REQUES	r	B99	-078-145	Page 1	of 1
	Collector Bowers/Trice	- 		any Contact ris Cearlock	Telepho 372-9		·		Project Co ordi FRENT, SJ	nator	Price Code	8N	Data Tu	rnaround
I	Project Designation 200 Area Source characteriz	ation - 200-CW-1 OU		ling Location B pond					SAF No. B99-078			•	45	Days
	Ice Chest No.	387	EL	Logbook No.	·	•		1	Method of Ship FED EX		نۇر.	1		
, .	Shipped To TMA/RECKA 10 ×6 10 -2			Property Na.	884				Bill of Lading/	Air Bill N 35		3 · .	Ø9	77
					•			·	coa B2	BCU	167	C		
	POSSIBLE SAMPLE HAZA	ards/remarks		Preservation	None	None	None	None	Cool 4C	Nost	Cool 4C	Cool 4C	Cool 4C	None
				Type of Container	₽G	•G	∌G	∌G	aG	nG	эG	aG	, aG	aG.
			•	No. of Container(s)	1	1.	1	1	1	1	1	ı	ı	• 1
Q	Special Handling and/or Sto	rage		Volume	60mL	60mL	60mL	120mL	250mL	250mL	500mL	500mL .	1000mL	1000mL
000024		Sample ana	LYSIS		Isotopic Uranius	Nickel-63	Technetism-99	Tritium - F	UOA - \$260A (TCL); VOA - \$260A (Add- On) [1- Propanol, Edianol]	pFI (Soil) - 9045	See item (1) in Special Impressions.	Semi-VOA - 8270A (FCL); \$PH-Diesel- Range - WTPH-D; PCBs - 8082	See Hem (7) in Special Instructions.	See item (3) is Special Instructions.
Pag	Sample No.	Matrix *	Sample Date	Sample Time			of the same			以 自然				100
75	DOWAD6	Soil	10-71-99	1130	Xo	X°	X	X_ '				<u> </u>	1	<i>X</i> •
71	BOWMD7	Soil	10-31-9		χo	χ-	X.	У.						X.
60	BOWM DE	50:1	10-21-91	1 1150	* ,	χ٠	y •	<u> y</u> •						× °
														
ľ	CHAIN OF POSSESSION		Sign/Prin	(Names	•		IAL INSTRI		S on SAF B99-078.				Matrix Soil	•
	clinquished By Color By Clinquished By Clin	0-11-99//401 Date/Time 12-99/-08- Non-Pate/Time 10-93-99/1438	Received By Received By Received By Received By Oo Received By	RIKKTTHOTEL	16/Time 27/95	Selent Vanad (2) N Sulfat (3) G Entrop Total	ium, Silver); IC dium, Zinc); Mo IO2/NO3 - 353. Ic); Sulfides - 9 iamma Spectros, ium-155); Gan Uranium (Uran icium-241	P Metals - ercury - 74 1; IC Anior 030; Ammo copy (Cesi una Spec - ium); Isott	race) (Arsenic, B 6010A (Supertrac 71 - (CV); Chrom ns - 300.0 (Chlori onia - 350.3; Total om-137, Cobalt-6 Add-on (Americi opic Platonium; Is	e Add-On) ium 11ex - 7 de, Fluoride 1 Cyanide - 0, Europiur um-241); S	(Beryllium, Cop 7196 e, Nitrate, Nitrite, 9010 w-152, Europium Strontium-89,90	Phosphate, Phosphate, 154, Total Sr; 12);	Water Vapor Other Solid Other Liquid	
	SECTION FINAL SAMPLE Disposal Ma DISPOSITION	ethod				<u> </u>	Dispos	ed By		•		D	ate/Time	·

Appendix 5

Data Validation Supporting Documentation

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:			(3)	D	Ε
PROJECT:	200-cw-1	······································	DATA PACKAGI	E: HUSA	76
		LAB: TN		DATE: 1/3	(/ ₀₀)
CASE:			sog: tto		
		ANALYSES	PERFORMED		
☐ Gross Alpha/Beta	Strontium-90	☐ Technetium-88	Spectroscopy	Gemme Spectroscopy	
Total Uranium	☐ Radium-22	7 Tritium	A M-R3		
SAMPLES/MAT	RIX Bown	1751 BOW/	UDZ BOU	BI KONC	wmD4
		DS BOWN	DC BOOM	407 BC	SWMD8
		•			
		-			521
1. Complete	EVEL: PROJECT: 200-(W-1 DATA PACKAGE: H-0590 ALIDATOR: T(LAB: TNU DATE: 1/3/00 CASE: SDG: H-0590 ANALYSES PERFORMED Company Redium-22 TAThtium TAMPLES/MATRIX TOWNTO TAMPL	🗆 N/A			
•					
lechnical ve	rification for	rms present?		Ye	s No N/A
Comments:			 	·	
	·			············	
	,	 	<u></u>	<u> </u>	
			<u> </u>		
2. Initial	Calibration .				S.N/A
Instruments/	detectors cal	ibrated withi	n		
one ye	ar of sample	analysis? .		Ye	es No N/A
					-
					•
Standards Ex	pired?	• • • • • •	• • • • • •	Yo	es No N/A
Comments:					
•	7 1 m				<u> </u>
				· -	
			<u> </u>		
					<u>-</u>

3. Continuing Calibration
Calibration checked within one week of sample analysis? Yes No N/A
Calibration check acceptable? Yes No N/A
Calibration check standards NIST traceable? Yes No N/A
Calibration check standards expired? Yes No N/A
Comments:
4. Blanks
Method blank analyzed? Yes No N/A
Method blank results acceptable?
Analytes detected in method blank? Yes No N/A
Field blank(s) analyzed?
Field blank results acceptable? Yes No
Analytes detected in field blank(s)? Yes No N/S
Transcription/Calculation Errors? Yes No (N/N)
Comments:
5. Matrix Spikes
Matrix spike analyzed? Yes No N/
Spike recoveries acceptable?
Spike source traceable? Yes No N/
Spike source expired? Yes No N/
Transcription/Calculation Errors? Yes No (N/
Comments:

AN 000027

6. Laboratory Control Samples	`••] N/A
LCS analyzed?	No	N/A
LCS recoveries acceptable? Yes		N/A
LCS traceable? Yes		(N/A)
Transcription/Calculation Errors? Yes	No /	(N/A)
comments: Am 241 LCS not/wsDG		
Comments: An241 LCS not/wsDG J 590 game spec MD2 - not w/sDG	<u>T</u>	
		
7. Chemical Recovery	· . E	A/N C
Chemical carrier added?) No	N/A
Chemical recovery acceptable? Yes		N/A
Chemical carrier traceable? Yes		TN/A
Chemical carrier expired? Yes		N/A
Transcription/Calculation errors? Yes		N/A
Comments:		\odot
8. Duplicates	[⊐ N/A
Duplicates Analyzed?	s) No	N/A
RPD Values Acceptable? Yes		N/A
Transcription/Calculation Errors? Yes	s No	N/A
Comments: thorum-228 (40%) th 730-43% - I		\bigcirc
5-90 day not WISDG J		
		_

9. Field QC Samples
Field duplicate sample(s) analyzed?
10. Holding Times
Are sample holding times acceptable?
11. Results and Detection Limits (Levels D & E) D N/A
Results reported for all required sample analyses? Yes No N/A Results supported in raw data?
Results Acceptable?
Transcription/calculation errors? Yes No N/A Comments: DI-152, 155 D2-152, 155 D3-152, 155 D4-152,
D5-182,155 D4-

N910196-11

DUPLICATE

ORIGINAL

SDG 7257

Contact Melissa C. Mannion

DUPLICATE

Lab sample id N910196-11 Dept sample id 7257-011

Lab sample id <u>N910196-06</u>

Dept sample id 7257-006

Received 10/25/99

% solids 90.2

SDG H0590 Client/Case no Hanford

Case no TRB-SBB-207925

Client sample id BOWMD6

Location/Matrix 200 B Pond

SOLID

. Collected 10/21/99 11:30

Custody/SAF No <u>B99-078-145</u> <u>B99-078</u>

ANALYTE	DUPLICATE pci/g	2 o ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TES T	origin al pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD	3ø Tot	PROT
Tritium	-0.006	0.061	0.10	400	ט	н	-0.048	0.057	0.099	ט			
Technetium 99	-0.130	0.15	0.49	15	U	TC	-0.101	0.27	0.62	ט	-		
Plutonium 238	-0.005	0.010	0.028	1.0	ט	PÜ	0.007	0.007	0.027	U	-		
Plutonium 239/240	0	0.005	0.020	1.0	U	ยบ	-0.007	0.014	0.039	ซ	-		
Nickel 63	0.737	1.3	2.2	30	U	NI_L	0.427	1.4	2.3	ט	-		
Americium 241	0.007	0.022	0.035	1.0	U	АМ	0.037	0.037	0.052	ט	-		
Total Strontium	4.26	0.24	0.13	1.0		SR	4.03	0.17	0.090		6	24	
Thorium 228	0.569	0.17	0.17	1.0	J	TH	0.378	0.17	0.20	J	40	77	
Thorium 230	0.787	0.18	0.17	1.0	J	TH	0.506	0.20	0.23	J	43	63	
Thorium 232	0.424	0.12	0.072	1.0	J	TH	0.356	0.13	0.12	J	17	69	
Potassium 40	11.8	0.74	0.35			GAM	12.4	0.86	0.22		5	35	
Cobalt 60	. a		0.043	0.050	U	GAM	U		0.022	U	-		
Cesium 137	0.186	0.040	0.036	0.10		GAM	0.157	0.028	0.031		17	53	
Europium 152	υ		0.080	0.10	ט	GAM	U		0.057	υ	-		
Europium 154	U		0.14	0.10	U	GAM	U		0.079	U	-		
Europium 155	ט		0.076	0.10	U	GAM	Ū		0.093	U	-		
Radium 226	0.564	0.071	0.062	0.10	•	GAM	0.484	0.048	0.044		15	40	
Radium 228	0.697	0.15	0.14	0.20		GAM	0.782	0.10	0.093		11	48	
Thorium 228	0.845	0.063	0.060			GAM	0.678	0.034	0.027		22	35	,
Thorium 232	0.697	0.15	0.14			GAM	0.782	0.10	0.093		11	48	İ
Americium 241	Ū		0.059		Ū	GAM	ט		0.033	ט	-		
Uranium 23#	U		4.6		a	GAM	ש		2.9	U	-		
Uranium 235	U		0.12		U	GAM	ש		0.090	ט	٠. ـ		

200 Area Soure Chara. - 200-CW-1 OU

QC-DUP#6 32743

DUPLICATES Page 2 TUMMARY DATA SECTION Page 17

Lab id TMANC Protocol Hanford Version Ver 1.0

Form DVD-DUP

Version 3.06 Report date 01/12/00

TMA/RICHMOND

METHOD SUMMARY

AMERICAN 241 HE SOIL

ALDER SPECTROSCOPY

Client <u>Hanford</u>
Contract <u>TRB-SDB-207925</u>
Case no <u>500 H0590</u>

Test AM Matrix SOLID

SDG 7257
Contact Melicse C. Mennion

RESULTS

CLIENT SNAPLE ID	iae Smole ID	nam sup- test fix planchet	Americium 241	
Preparation batch 6904-	172			
30/9/01	m910196-01	1257-001	9.966 J	
BOMMOS	N910196-02	7257-003	1.14	
BOM/@3	N910196-03	7257-003	. 0.337 J	•
BOWNDA	N910196-04	7257-004	1.32	
BOWNES	W910196-08	7257-005	0.3#1 3	
BOIMEDE	N910196-96	7257-006	U	
B030107	#910196-07	7257-007	ď	
BONDS	X910196-08	7257-008	u .	
BLK (QC ID=32742)	F910196-10	7257-010	T	·
LCS (QC ID=32741)	M910196-09	7257-009	ok	
Applicace (#910196-06)	M010196-12	7257-011	- 0	
buingl values and limit	te from metho	d BOLA (pCl/a)		

ETHOD PERFORMANCE

00 Area Soure Chara. - 200-CM-1 00

LEFT SAMPLE ID	SAPILE ID	PAN S		DA ALTQ	Par Pac		AIETO	EPV	edin COUNT	rand keV			PREPARED	NOL- YZED	DETECTO
poration batch 6904-	172 2s pr	op erre	≈ 5,0 t	Reference	Lab I	for ebook	6304	PØ ·	172						"
1601	N910196-01		٠.	037 0.500			60		106			77	12/22/99	01/06	\$8-013
PC)2	N910196-02		٥,	045 0.600			66		606			77	12/22/99	01/06	55-01E
MO3	X370736-02		0.	042 0.300		٠.	. 70		106			77	12/22/99	01/06	22-036
PED4	M910196-04		0,	056 0.500			. 62		760			77	12/22/99.	01/06	25-043
PDS	M910196-05		۵,	051 0.500					760.	•		77	12/22/99	01/06	35-054
ND6	W910196-06		a.	052 0.500			54		136			76	12/22/33	01/07	22-018
MD7	3910196-07		D.	025 D.500			45		196			78	12/22/99-	01/97	65-011
MD()	M910196-08		٥.	028 9.500			78		116			78	12/22/99	01/07	25-012
(QC ID=32742) :	¥910196-10		0.	024 0.500			43		196				12/22/99	01/07	ES-013
(QC ID=32741)	M370736-02		٥.	046 0,500		-	80		763		•		12/22/99	12/31	85-059
(QC ID-32743)	Na1013e-JT		0.	035 0.508			77		196 	:	,	78	12/22/99	01/07	85-015
nel values and limit	ts from mothe	4	1.	0 0.500			20-10	 5	700	100		180		, , , . .	

THOD BUSONIES

Page 1

ARY DATA SECTION

Page 29

Protocol Hanford

Version Ver 1.0

Form DVP-CNS

Version 3.05

Report date 02/10/00

TMA/RICHMOND "SAMPLE DELIVERY GROUP HORSO

_Test <u>SR</u> Matrix <u>SOLID</u> SDG <u>7257</u> Contact <u>Melissa C. Mangion</u>

----METHOD SUMMARY
__TOTAL STRONGTON- IN SOIL
BETA COUNTING

Client Hanford
Contract TRB-SBB-207925
Case no SDG H0596

RESULTS

	TAN PA	V SUV-	Total					
CTIDAL ENGER ID	SAMPLE ID TE	ST FIX PLANCEET	Strontium		_	,		
Preparation batch 6904-	172				,			
3017(D1	N31013 6-02	7257-001	73700				•	•
B01902	N910196-02	7257-002	9930					
201003	M910196-03	7257-003	1580		• .		,	,
2019504	¥310196-04	7257-004)) 6		•		•	
BOHNOE	¥910196-0\$	7257-005	384		•	•		•
BOWNESS.	M910196-06	7257-006	4.03			•		
BOWED?	¥920196-07	7257-007	4.12	. •		•		
BOHROS	M910196-08	7257-008	0.455 J			•		
BLK (QC ID=12742)	¥910194-10	7257-010	g			: .		•
LCS (QC 3D=32742)	¥91019#-09	7257-009	ok.					•
Applicate (#910196-06)	N9 201 96-11	7257-011	, ok					
loninal values and limit		RULe (pci/g)	1.0					

TOURNESS OF STREET

CHT SNOTE ID	engle id	teri aik	ACT\2	a yrid	PREP	TICH DILU-	ATECD	EFF t	rin COORT			PREPARED	NOT-	DETECTO
paration batch 6904-	172 2e pr	op error 10	.0 t Ref	esence	Iab #	oceso	k 6904	PS.	173					
1007	X910196-07		2.1	1.00			19		2		61	12/20/99	12/21	CR3-220
NC2	M910196-02		6.7	1.00	,	-			408		63	12/20/99	12/29	GR9-223
MD3	N910196-02		3.1	1.00			90		466		61	22/20/33	12/31	GNB-224
MD4	N910196-04		_1,1	1.00			¥7		400		61	12/20/99	12/21	GRD-228
MDE	M910196-08		0.10	1.00			46		400		61	12/20/99	12/21	GR9-231
HDE	M870736-0€		0.090	1.00			28		400		61	12/20/99	22/21	GRB-220
107	W910196-07	•	0.13	1.00	•		49		400		61	12/20/99	12/21	GRE-202
1278 (C21	N910196-08		0.13	1.90			*4		400		61	12/20/99	12/21	GRB-203
(QC ID-32742)	N310186-10		0.12	1.00			72		400			12/20/99	12/21	GRB-208
(QC ID-32741)	M910195-09	•	0.12	1.00			74		400	•		12/20/99	12/21	030-204
icate (M910196-06)	N910196-11	•	0.13	1.00		•	84		200		70.	12/20/99		
(QC 1D=32743)				,	٠		, (. •	•					
nel values and limit	s from method		1.0	1.00	·				100		100			

Page 8
INTO SUPERATES
Page 8
INT DATA SECTION
Page 36

Protocol Ranford
Version Ver 1.0
Porm DVD-CMS
Version 1.06
Report date 02/10/03

PAGE 11 PAGE 11 PAGE 11

. 660

Propert at del.

Propert to del.

Propert del.

Propert del.

Propert del.

			DET	001	· · ·	T41 030.0	bodses mort astell bas s	outer fax
				· •			(6)	(OC ID-33.
03'01'00	ET/ET	46/20/ET	TS.	334	•	145 ET 0	TT-96TQT6R (90-96TQ1	(temts (MS)
07°60°E0	£1/21	56/20/2T		SEE		\$41 630 0	(19) Natolag-Da	(OC 10-33.
10'50'EH	£2/E1	66/20/27	•	322		171 580.0	MSTOTBE-TO	(ÖC ID-35
00.70,EM	es/st	56/20/61	£3	336		0'020 003	BO-96TOTER	104
00,04,00	£1/21	13/03/38	ES .	FOZ		201 T30.0	LO-SETOTER	LOSI
00.TO.EH	73\73	73/03/33	E\$	330		Tes 530.9	90-961016H	304
10.10,0E.0	13/13	15/05/38	23	522		AST TTO 0	20-961016R	SQ1
09,60,50	ET/ET	15/05/88	CS.	6EE		295 77 0	Matolag-of	FON
03°07°01	73\79	66/20/2T	T.S	339		689 PE'0	E2-967076H	104
M.05.00	13/13	66/20/21	ES ,	316		TED 11.0	20-96totem	2034
00 , TO , 824	13/38	66/20/21		505		499 31.0	TO-SETUTEN	TON
		•		ELT Ed	notabook da	l 25.0 % Reference L	10220 dead at ELT-9069 4220	d nollared
(MASTER	XEBD	CERVARY	GUER APR	Vest gir f	A HOEL DYA	S S/TOG KY	A 1511 OI THOMAS OI	FLOWS INZ
	-INNY		STAT THE	2 1534 COOM 145H D	THE DITO AND			
							PERFORMANCE	CORLS
		,		•	•		#PN-17GOREAG	Z Y A A B B

	97.0	O!	5 0 ° 0	(B/19d) man		initial values and limit sxeD eves sext on
	sko .	<u>a</u>	•	££0-₹25₹	1437073E-7T	Supitioned (Natoriae-of)
	340		oje	400-4524	60-96TOTEN	(T0128401 30) \$33
	`.		A	010-1257	OT-96TOTEN	BLK (QC ID-33762)
	₹ 270.0		۵	800-7257	80-setaten	BOWDE
	ETA.0		۵	100-1221	LD-96TOTEM	COMO
•	4\$T'0		a	900-4524	Rateibe-og	POHOT
	P.0E		:0	12E1-008	E0-961016M	SCHOOL
	702		B	7557-004	PO-DETOTEM	PERMIT
4	P.61		Α.	1357-003	20-96T016H	COMMO
•	974		Δ	£00-7257	N310136-05	DOMEDS
 		-	۵		#87078E-07	FOMOT
						Preparacion bacch 6906-1

Crient Synks ID That FIX FLANCIST Cobele 60 Ceelum 137

•

STIUSSA

EDG 7257 Contact Meliane C. Hannion

CILIOS XITSON MED SEAT

TMA/RICHMOND

COS DOCCO

METHOD SUMMARY

CONTRACTOR CONTRACTOR

LEB 10 .00 01:01M

Case to SDG. H0590 ---

\$28705-552-575 338-207925

TECHLAW, INC.

451 Hills, Suite 23 Richland, WA 99352 509-375-5667 509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: I

Date: 8 February 2000

Information Request

H0590 - Wet chemistry

Page 002, Methods Glossary, does not list cyanice by 9010B as an analysis that was conducted (the data is present, but the data package needs to be corrected).

cops of revised sheet Attached

RZMV 2-7-00

Recra LabNet Philadelphia

L-WI-034/B-06/99

WET CHEMISTRY METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	<u>ASTM</u>	SW846	<u>OTHER</u>
.% Ash	D2216-80		
% Moisture	D2216-80		ILMO4.0 (e)
% Solids	_		ILMO4.0 (e)
% Volatile Soilids	D2216-80		,
ASTM Extraction in Water	D3987-81/85	· }	
BTU	D240-87		
CEC		9081	_ c
Chromium VI		3060A/7196A	
Corrosivity by coupon by pH		1110(mod) 9045C	
Cyanide, Total		2.4. ° √ 9010B	ILMO4.0 (e)
Cyanide, Reactive		Section 7.3	
Halides, Extractable Organic		9020B	EPA 600/4/84-008
Halides, Total		9020B	EPA 600/4/84-008
EP Toxicity		1310A	
Flash Point		1010	
Ignitability		1010	
Oil & Grease		9071A	
Carbon, Total Organic		9060	_ Lloyd Kahn (mod)
Oxygne Bomb Prep for Anions	D240-87(mo	od) 5050	
Petroleum Hydrocarbons, Total Re	coverabl e	9071	_ EPA 418.1
pH, Soil		9045C	
Sulfide, Reactive		, Section 7.3	
Sulfide		<u>√</u> 9030B(mod)	
Specific Gravity	D1429-76C/	D5057-90	
Sulfur, Total		9056	
Synthetic Prpearation Leach		1312	
Paint Filter		9095A	
Other: Autrate Titut	Method:	EPA 353.2	
Other: annonia	Method	EPA 350.3	·
Chloride Fluoria Nitrite, Phospha	de Sulfa	to SEPA 300.0	

002

TECHLAW, INC.

451 Hills, Suite 23 Richland, WA 99352 509-375-5667 509-375-5151 (fax)

To: Jeanette Dunçan

From: Bruce Christian

Pages: I

Date: 11 February 2000

Rejected data

HO590 - VOA-Diesel range organics

Due to the surrogate being diluted out, the diesel range organics result in samples B0WMD4 will be rejected.

TECHLAW, INC.

451 Hills, Suite 23 Richland, WA 99352 509-375-5667 509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 11 February 2000

Rejected data

HO590 - PCB

Due to the surrogate being diluted out, the aroclor-1016/1221/1232/1242/1248/1254 results in samples BOWMD1, BOWMD2, BOWMD3, BOWMD4, and BOWMD5 will be rejected.

TECHLAW, INC.

451 Hills, Suite 23 Richland, WA 99352 509-375-5667 509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 8 February 2000

Rejected data

HO590 - Metals

Due to a matrix spike recovery of -120%, the mercury results in samples B0WMD6, B0WMD7 and B0WMD8 will be rejected.

TECHLAW, INC.

451 Hills, Suite 23 Richland, WA 99352 509-375-5667 509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 8 February 2000

Information Request

H0590 - Semivolatile

The analytical performance information provided for this project does not list any levels for semi-VOAs, what do you want me to use for PQLs and accuracy/precision limits??

Brace

We contract PALs and

apply Precision/ Acrony criterist

similar to other requirements for thir

SAF

KIN 2-8-00

TECHLAW, INC.

451 Hills, Suite 23 Richland, WA 99352 509-375-5667 509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: I

Date: 8 February 2000

Information Request

H0590 - Wet chemistry

Page 002, Methods Glossary, does not list cyanice by 9010B as an analysis that was conducted (the data is present, but the data package needs to be corrected).

BHI Sample Management Phone: (509) 372-9346 FAX: (509) 372-9487

ROSIONIE REPORTING

To: B. Christian	Fax: - 15-5151
From: R ONEIST	Date: 2-1-00
Re: IR HO570	Pages: Z
cc:	
□ Quick Turn / Priority Data	□ Final Data Package
See - Ha-had	
	·

TECHLAW, INC.

451 Hills, Suite 23 Richland, WA 99352 509-375-5667 509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages:-1

Date: 31 January 2000

Information Request

H0590

The sample summary lists the replicate samples as BOWN02 and BOWMX1, however those samples are in a different SDG. Were the duplicates run in different SDGs??

Bruce,
The sample summary has some errors. BOWNOIT BOWMX)

are not associated with this sof. Field replicates
in this SDF are BOWMDI & BOWMDI. There
also is a Quanterm split (Bowmma). We are
rechecking the sammers information and will provide
you with a new one soon

Kish Win 2-1-00

TRANSMISSION RESULT REPORT(FEB 01 '00 03:17PM'

BHI S&D MANAGEMENT 509 372 9487

(AUTO)

THE FOLLOWING FILE(S) ERASED

FILE FILE TYPE OPTION TEL NO. PAGE RESULT

018 MEMORY TX 3755151 02/02 OK

ERRORS

1) HANG UP OR LINE FAIL

2) BUSY

3) NO ANSWER

4) NO FACSIMILE CONNECTION

BHI Sample Management Phone: (509) 372-9346 FAX: (509) 372-9487

fates in all a library particular

To: B. Christian	Fax:
From: R WC155	Date: 2-1-00
Re: IR HOSTO	Pages: Z
CC:	
☐ Quick Turn / Priority Data	□ Final Data Package
1110	

TECHLAW, INC.

451 Hills, Suite 23 Richland, WA 99352 509-375-5667 509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 8 February 2000

Information Request

110590 - Semivolatile

The analytical performance hooms to the project does not list any levels for semi-VOAs, what do you was to the last of the last of the call acceptance project does not list any levels for semi-

Brain

ordard 5 YOP PGLs here

Duncan, Jeanette M

Todd, Mary E Wednesday, March 15, 2000 1:18 PM Duncan, Jeanette M validation reports

From: Sent: To: Subject:

Jeanette,

We do not have any comments on the validation packages. We will support the comments from Rich.

Thanks

Mary & Chris

	Review Com	ment Record (RCR	3)		1. Date 2/25/00		iew No. /QA0015
					3. Project 200-CW-1	4. Pag Pa	ge 1 of 1
5. Do	cument Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewe	r	8. Organization/Gr	oup 9, 1	Location/Phone
SDG	SDG No. H0509 200 Area Source Characterization - 200- CW-1 Operable Unit			cey	BHI/QA	H0-	-16/372-9208
7. Co	nument Submittal Approval:	10. Agreement with indicated con	mment disposit	ion(s)	11. CLOSED		The same of the sa
Org	anization Manager (Optional)	Date	wer/Point of Co	intact	7/15/00 Date	Reviewer/I	Point of Consect
	·	Autho	r/Originator		-	Author/Ori	ginator
12. Item	13. Comment(s)/Discrepancy(s) (Procomment and detailed recommendation resolve the discrepancy/problem indicates and the commendation of the comment of	on of the action required to correct/	14. Hold Point	15. Dispo	sition (Provide justification i	f NOT accepted.)	16. Status
1	PCB: OK - No Comments		- -	ļ			
2	Radiochemistry: Page 010, Need to i in μg/g.		s	Cerra	* Je		
3	Wet Chemistry: OK - No Comments			carr	- K-		
4	Volatiles: Page 09, under Diesel rang B0WDM4. This should be B0WMD4	•					
5	Volatiles: Page 11 and 12 indicates the reported units for the Alcohol and Die be clearer if the pages were broken do	sel are in MG/KG. Possibly it would own with the first page titled Volatile		ىم	nes		
	Organic Analysis, Soil Matrix (UG/Ke Alcohol and Diesel Analysis, Soil Ma				ye-		1
6	Inorganic: Page 10, The page title ind the units are MG/KG.	licates the units as UG/KG; whereas,		Carre	T ps	- <u></u>	
7	Semivolatile: OK - No Comments						
8	<u> </u>				·		
9						<u> </u>	
10			i [}

	Review Com	ment Record (RCR	.)		1. Date 2/25/00		Review No. BHI/QA0015	
					3. Project 200-CW-1	4	Page 1 of 1	
5. Do	cument Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer		8. Organization/Gro	ир	9. Location/Ph	one
SDG 1	No. H0509	200 Area Source Characterization – 200- CW-1 Operable Unit	Claude Sta	cey	BHI/QA		H0-16/372-92	08
17. Co	nment Submittal Approval:	10. Agreement with indicated con	mment dispositi	on(s)	11. CLOSED			
Org	ganization Manager (Optional)	Date Revie	wer/Point of Co	ntact	Date	Rev	riewer/Point of Contac	ct
		Autho	or/Originator	**		Aut	hor/Originator	
12. Item	13. Comment(s)/Discrepancy(s) (Procomment and detailed recommendation resolve the discrepancy/problem indicates and the commendation of the commendation resolve the discrepancy/problem indicates and the commendation of the com	on of the action required to correct/	14. Hold Point	15. Disposi	tion (Provide justification is			16. Status
1	PCB: OK - No Comments	······································						<u>- </u>
2	Radiochemistry: Page 010, Need to it in µg/g.	ndicate the results for Total Uranium	is					
3	Wet Chemistry: OK - No Comments							
4	Volatiles: Page 09, under Diesel rang B0WDM4. This should be B0WMD4	-						
5	Volatiles: Page 11 and 12 indicates the reported units for the Alcohol and Die be clearer if the pages were broken do Organic Analysis, Soil Matrix (UG/K. Alcohol and Diesel Analysis, Soil Matrix (UG/K.)	esel are in MG/KG. Possibly it would own with the first page titled Volatile G) and the second page being titled trix (MG/KG)						
6	Inorganic: Page 10, The page title inc the units are MG/KG.	licates the units as UG/KG; whereas,						
7	Semivolatile: OK - No Comments							
8								ļ
9								<u> </u>
10	1			1				I

.

Reviev	v Comment Record (RC	R)	1. Date 2/03/00	2. Review No. BHI/QA0013	
			3. Project 200-CW-1	4. Page Page 1 of J	,
5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Grou	p 9. Location/Ph	one
SDG No. H0506	200 Area Source Characterization – 200- CW-1 Operable Unit	Claude Stacey	ВНІ/QА	H0-16/372-92	208
7. Comment Submittal Approval:	10. Agreement with indicated	commené A	II. CLOSED	· · · · · · · · · · · · · · · · · · ·	
Organization Manager (Optional)		on page 3	Date	Reviewer/Point of Contac	ct .
	i tom	And .		Author/Originator	
12. 13. Comment(s)/Discrep Item comment and detailed rec resolve the discrepancy/p	commendation of the	correct.	vition (Provide justification if)		16. Status
General Comment: None for the qualifiers. The value copies data validation suppackage. This would include matrix spike, duplication	of the packages had \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	Roude	Ceses the Molaso is In collect cases the her beca	The C bbrobuch	
PCB: Page 010, indicates the units to be UG/KG. T would also change the cor limits on page 003 and 00	he CRDL for PCB should inclusion that the laboratory		rectal		
	pike indicates the control lim	%; its	vected per new a	سرال	
	indicates the specified RPD to be 35%; wherea DE/RL 99-07) specifies the RPD acceptance lim	is, j	reclad ser new o	und las	
Radiochemistry: Page 00: spike recovery range is 70 range is 70 to 130% or 80	top of page for accuracy specifies the matrix to 130%. This should read matrix spike recove to 120%, since the isotopes determined by e is 80 to 120 % as specified in the project	ery Cann	ected as hour o	, u de lim	
75 Radiochemistry: Page 00:	3 indicates that Np to be qualified as "J" because	•	1/2 Z/14069	y I	

Review Comment Record (RCR)

1. Date 2. Review No.
2/03/00 BHI/QA0013
3. Project 4. Page 200-CW-1 Page 2 of P

. 12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
	the tracer recovery was 23%; however, above it states the acceptable range for tracer recovery is 20 to 105%. It would appear that tracer for Np falls in this range and should not be qualified.		carretal	
6	Radiochemistry: Page 003, Precision indicates acceptable RPD to be 35%; whereas, project documents has acceptance for precision to be 30%.		corrected per new quelles -	_
A	Radiochemistry: Page 11 the required detection limits for Co-60, Eu-152 and 154 are in different then those specified by the project. Co-60 should be 0.1, Eu-152 and 154 should be 0.2. With these changes the isotopes listed on pages 004 and 005 will need reviewed.		carrected per new quelelines	
	Wet Chemistry: Page 002, Accuracy has the matrix recovery acceptance limits as 75 to 125%; whereas, the project requirements are 70 to 130% recovery.		corrected per new quelling	· · · · · · · · · · · · · · · · · · ·
-9	Wet Chemistry: Page 003, Precision has the RPD limits as ±35%; whereas, the project requirements are ±30% RPD.		corrected on new quelles -	-
110	Wet Chemistry: Page 010 does not indicate a CRDL for Cr-VI. Project PQL for Cr-VI is 0.7 MG/KG. This would make the laboratory DL for sample B0W694 above the project PQL.		carrected :	
И	Volatiles: The detection limits listed on page 011 do not meet the project PQL on the majority of the compounds.		carrected per new gueldines -	
1/12	Semi-Volatiles: Page 001 in the table listing the samples under sample ID it list a sample B0W6B7, this should be B0W697.		corrected	
40	Semi-Volatiles: Again the accuracy and precision acceptance criteria do not reflect project requirements.		carrected per new quedonce	-
15	Semi-Volatiles: Project documents call for the determination of tri-butyl phosphate; however, it was no analyzed for by the laboratory and no mention of the lack of tri-butyl phosphate in the validation package.		Rich Wiess resolution	
15	Inorganics: Again the accuracy and precision acceptance criteria do not reflect project requirements.		corrected por new guidles	- -
16	Inorganics: Page 010 the heading at the top of the page indicates the units for the data is in UG/KG; whereas, the laboratory data sheets indicate the data is in MG/KG.		carred Not Correcte Que)	,
12	Inorganics: The validation report indicates the laboratory detection limit for mercury was exceeded for six of the samples. Reviewing the laboratory		/ 2	

Review Comment Record (RCR)	1. Date	2. Review No.
10010W Common Rootia (RCR)	2/03/00	BHI/QA0013
	3. Project	4. Page

200-CW-1

Page 3 of 2

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.) detection limits of 0.02 would indicate that they met the projects PQL of 0.05.	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
	Inorganic: Page 010 most of the CRDL listed are not what the project required.		correctel per neur guedelie	
	It would appear that the validator either do not have the project specific data requirements or the wrong project data requirements were used for the validation.			
	And the use	· .		

New Item's

PLB's, pg 04, Completeness indicates Data Package No HO 534-RLN.
This should be Vota Package HO 506-RLN.

of Enorganice: - Item 16 on page 2 of RCR was not consected.

Validation Package Review - 200-CW-1 Packages - RL Weiss

Package H0509 - No comments

Package H0534 - No comments

Package H0590 - No comments except

Semivolatile, Pg. 4 & 5, "Analytical Detection Levels"; Wording should be that all nondetects failed to meet detection limits specified by the CRDL. See wording in similar sections of H0506 & H0534.

already corrected - corrections of

TECHLAW, INC.

451 Hills, Suite 23 Richland, WA 99352 509-375-5667 509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 31 January 2000

Information Request

H0590

The sample summary lists the replicate samples as B0WN02 and B0WMX1, however those samples are in a different SDG. Were the duplicates run in different SDGs??

TECHLAW, INC.

451 Hills, Suite 23 Richland, WA 99352 509-375-5667 509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 31 January 2000

Information Request

H0590 - Rad

Americium-241 - Blank not prepared with the SDG - J all Americium-241 - LCS not analyzed with the SDG - J all

Plutonium - Blank and LCS not prepared with the SDG - J all

Thorium - Blank and LCS not prepared with the SDG - J all

Strontium-90 - Duplicate not analyzed with the SDG - J all Strontium-90 - Sample B0WMD2 was analyzed 8 days after the SDG - J

Gamma Spec - Sample B0WMD2 was analyzed 15 days after the SDG - J

BHI Sample Management Phone: (509) 372-9346 FAX: (509) 372-9487

istication of the property of

To: B. Christian	Fax: A THETS 5 375-5151
From: R ONCIST	Date: 2-1-00
Re: IR HOSTO	Pages: Z.
CC:	
Quick Turn / Priority Data	☐ Final Data Package
See afforbal	
Kich	